THE THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE.

Whole Series, Vol. XXXIX. | DETROIT, MICH., AUGUST 15, 1915. | Third Series, Vol. XXXI, No. 8.

ORIGINAL COMMUNICATIONS.

A STUDY OF THE EFFECTS OF ACET-THEOCIN-SODIUM ON PATHOLOGICAL CONDITIONS OF BLOOD-PRESSURE, EXCRETION OF URINE, AND FUNCTIONAL ELIMINATION.[1]

BY HARVEY G. BECK, M.D.,

Clinical Professor of Medicine, College of Physicians and Surgeons, Baltimore, Md.

The introduction of simple sphygmomanometric methods of ascertaining arterial tension with scientific accuracy has awakened a keen interest in and thrown much light on one of the greatest problems one has to deal with in internal medicine, namely, hypertension, with its associated pathological changes of the heart, blood-vessels, and kidneys.

With the simple observation of blood-pressure, one will find in the sphygmomanometer an instrument as essential to the clinician as the stethoscope or the thermometer. To it solely can be attributed the great progress made in gaining a clearer conception of this perplexing subject, and in treating more rationally the underlying diseases.

The chronic degenerative diseases of the heart, blood-vessels, and kidneys form a pathological triad, which, unlike many infectious diseases, have not been favorably influenced by modern preventive methods of treatment; on the contrary, it is a well-recognized fact that these diseases are appallingly on the increase.

Their increase may be attributed to two main factors: First, public health and preventive medicine, the successful administration of which makes it possible for a much larger percentage of individuals to attain the age when these diseases manifest themselves. Second, stress of mind and body incident to the daily rush and turmoil of a business, professional or social career, which tends to increase blood-pressure.

It is owing to the facts above stated that hypertension with or without its concomitant syndrome has become a problem which confronts the physician daily. Not to attempt to relieve it is hazardous to the patient, as it most certainly curtails the usefulness of the individual, and often sacrifices years of life.

Independent of the regulation of the habits of the individual, comparatively little benefit is to be derived from the use of old-time remedies. Potassium iodide frequently gives favorable results in luetic cases, but in the non-luetic it is of doubtful utility. Nitroglycerin has only a transient effect, and the nitrates may be useful in a certain class of cases.

If an individual is as old as his blood-vessels, and if his blood-vessels age according to the degree of toxemia—accepting Metchnikoff's theory—then, *a priori,* one should be inclined to resort to the use of eliminant drugs rather than the use of vasodilators for the relief of symptoms associated with hypertension.

Considering, therefore, that a rational indication for treating conditions resulting from hypertension should be established on such a physiological basis, acet-theocin-

[1]Read at a meeting of the Research Society of the College of Physicians and Surgeons.

sodium, which is reputed to be the best-known renal diuretic, was employed in a series of cases, notwithstanding the fact that the manufacturers claim it has no distinct effect on blood-pressure.

Theocin is a synthetic product and is isomeric with theophyllin, a natural alkaloid found in tea. Its close relation to caffeine is indicated by the fact that theocin is a dimethylxanthin, while caffeine is a trimethylxanthin. Owing to the comparative insolubility of theocin in water, its soluble salt, acet-theocin-sodium, is more generally used and is better tolerated than theocin itself. Because of its powerful diuretic properties, it has been extensively employed in dropsies of cardiac and vascular origins, and in chronic nephritis.

In this series of cases the soluble salt, acet-theocin-sodium, has been used, although for the sake of simplicity it is referred to as theocin. The cases here reported may be divided into two groups:

1. Those in which the effects upon the blood-pressure and general symptoms are noted; and

2. Those in which, in addition to the effects on the blood-pressure and general symptoms, its effects on the urinary excretion and the functional elimination, according to the phenolsulphonephthalein test, were noted.

Case 1.—Female, aged sixty. Diagnosis: Chronic emphysema with asthma, cardiac hypertrophy, and hypertension.

The patient has had asthmatic attacks since she was ten years of age. In her early life she was occasionally free from symptoms for considerable periods. In more recent years she has suffered continuously. Her habits were of a sedentary character and all her life she indulged to excess in tea, coffee, and milk.

The left heart was enlarged and the second aortic sound loud and accentuated; no murmurs were audible. The arteries were tense and slightly sclerosed and the blood-pressure was 220. The urine was free from albumin and casts.

Theocin was administered in doses of 4-grain tablets three times a day. At the end of five days the blood-pressure fell to 188.

The asthmatic attacks subsided and the general symptoms improved. The continuous use of one tablet daily maintained the blood-pressure from 160 to 170, but did not completely control the asthmatic attacks, although her general condition was decidedly improved.

Case 2.—Male, aged forty-six, police officer. Diagnosis: Arteriosclerosis, cardiac hypertrophy, albuminuria, acute paroxysmal pulmonary edema, hypertension.

General health has been good until about two years ago. The symptoms began with dull aching precordial pains lasting fifteen to twenty minutes and dyspnea on exertion; the dyspneic attacks became more severe and finally were associated with definite seizures of acute paroxysmal pulmonary edema. There was hypertrophy of the left heart with a mitral systolic murmur. The arteries were slightly sclerosed and the blood-pressure varied from 180 to 195. The urine was normal in amount and density and persistently showed the presence of traces of albumin with occasional hyaline casts.

Potassium iodide was administered freely from September, 1911, to March, 1912, without influencing the blood-pressure, although the general symptoms improved. After taking theocin for six weeks the blood-pressure was 165. Subsequently on discontinuing theocin and readministering potassium iodide the pressure gradually increased to 195. Theocin was again resorted to in doses of two tablets daily. In two weeks the pressure had fallen to 158.

Case 3.—Male, aged sixty-eight, bricklayer. Diagnosis: Arteriosclerosis, chronic nephritis, cardiac insufficiency, hypertension.

Following exposure to wet and dampness one year ago, cough, dyspnea, and edema of the ankles developed. These symptoms continued, and on account of them the patient had to quit work. He had marked arteriosclerosis with enlargement of the

heart, a loud, blowing mitral systolic murmur, and a blood-pressure of 180. The urine was scant and contained large amounts of albumin, granular and hyaline casts. On exertion he became cyanotic and orthopneic. Theocin, 5 grains t. i. d., was ordered for periods of five days, alternating with intermissions of similar periods.

He reported seven months later, stating that he had taken the three doses daily, without missing a dose, during those seven months, and that he had worked at his trade (bricklaying) all summer, with the exception of every third week, when he rested.

The cough, dyspnea, and edema had entirely disappeared. He voided urine freely, specific gravity was 1022, and albumin was positive. The blood-pressure was 165, but the systolic murmur was still heard.

The patient considered himself practically well.

Case 4.—Male, aged fifty-seven, lawyer. Diagnosis: Chronic gout, cardiac hypertrophy, hypertension. He was a big eater, especially of meat, and manifested a decided tendency to gout and obesity.

In the past few years he had become extremely nervous and was barely able to attend to his professional duties. He complained of vertigo, shortness of breath, muscular twitchings and cramps, and vesical irritability.

Both heart and liver were enlarged. Blood-pressure was 180 and arteries were normal. Accentuation of second aortic sound was marked, and there was a slight diastolic aortic murmur. The prostate was enlarged. The urine contained traces of albumin due to prostatic discharge, but was otherwise normal. The functional elimination test amounted to 64 per cent.

Following the administration of theocin there was a most remarkable improvement. All the subjective symptoms subsided, the heart and liver decreased in size, and the blood-pressure returned practically to normal (135-140).

Case 5.—Female, aged fifty-nine. Diagnosis: Chronic interstitial nephritis, arteriosclerosis, hypertension.

Her previous health and habits had been good. For a year or more she had noticed a tendency to dyspnea on exertion and had frequent attacks of vertigo. Recently these symptoms became alarming; the dyspneic attacks were intense and came on independent of exertion. The arteries were slightly thickened, the heart enlarged, and the urine contained albumin and casts.

With the use of potassium iodide and various diuretic drugs the blood-pressure records for January, February, March, and April, 1912, were respectively 210, 185, 200, 190.

After taking theocin for six weeks the record showed a blood-pressure of 150. She was able to exercise freely without dyspnea, suffered no vertigo, and successfully withstood an operation for strangulated hernia.

Case 6.—Male, aged fifty-five, revenue inspector. Diagnosis: Acute paroxysmal pulmonary edema, bronchopneumonia, thrombophlebitis, pulmonary embolism, hypertension.

With the exception of attacks of shortness of breath for the past three or four years, the patient enjoyed remarkably good health. He never drank, but ate heartily all his life, meat comprising the chief article of diet. About two years ago he began to suffer with severe attacks of acute paroxysmal pulmonary edema. In one of these he developed an aspiration pneumonia. This was followed by thrombophlebitis of the femoral vein, which in turn was followed by three attacks of pulmonary embolism, one of which was associated with effusion into the pleura and pericardium. He later developed ascites.

On examination a year ago he had a blood-pressure ranging from 185 to 190. During an attack of acute pulmonary edema it was 220. The pulse was 68, irregular and intermittent. The vessels were normal. A soft, systolic murmur was heard over the base and the heart was somewhat enlarged.

Repeated examination of the urine was negative for albumin and casts.

Since the administration of theocin he has had no more attacks of pulmonary edema. The blood-pressure was gradually reduced to 140.

Case 7.—Female, aged sixty. Diagnosis: Chronic myocarditis, hypertension.

For several months the patient suffered with nervous symptoms besides shortness of breath on exertion, and vertigo. Recently she developed chills, sweats, and edema of the legs.

The apex of the heart was displaced to the left. There was a mitral systolic murmur and an occasional intermission of the beat. Blood-pressure was 192. The urine was negative.

Theocin, 5 grains t. i. d., reduced the blood-pressure to 165 on the fifth day, and to 158 on the eighth day.

Case 8.—Male, aged seventy-two, railroad engineer. Diagnosis: Arteriosclerosis, chronic myocarditis, acute paroxysmal pulmonary edema, hypertension.

He enjoyed good health all his life, and until a few months ago was regularly engaged at his occupation. About a year ago he began to have attacks of dyspnea. These increased in frequency and severity until he was compelled to give up his occupation. He finally had daily attacks, many of which terminated in acute pulmonary edema.

The blood-vessels were thickened, the blood-pressure ranged from 212 to 220, and during the attacks it exceeded 250. The heart was much enlarged and there was a loud systolic mitral murmur. The urine was diminished in amount, but was free from albumin and casts.

The paroxysms of dyspnea and acute pulmonary edema, which were extremely severe, were uninfluenced by nitroglycerin, the attacks occurring with the same frequency, about one or two a week. After the administration of theocin, 5 grains t. i. d., they promptly ceased, and he was able to completely abort an attack by taking a dose as soon as the premonitory symptoms appeared. During a period of almost three months, while taking one 4-grain tablet daily, he had only one mild attack. There was a fall of the blood-pressure to 152 with a corresponding improvement in his general condition, so that he was able to resume work, although in a less responsible position.

Case 9.—Male, aged forty-nine, farmer. Diagnosis: Chronic interstitial nephritis, arteriosclerosis, hypertension.

He complained during the past five months of dizziness, vertigo, headache, and shortness of breath, and was extremely nervous. The heart sounds were clear and accentuated, there was no enlargement discernible, the vessels were markedly sclerotic and the blood-pressure persistently high, ranging from 220 to 230. He voided 600 Cc. of urine in twenty-four hours with a specific gravity of 1010, containing albumin, granular and hyaline casts. His functional elimination was 39 per cent.

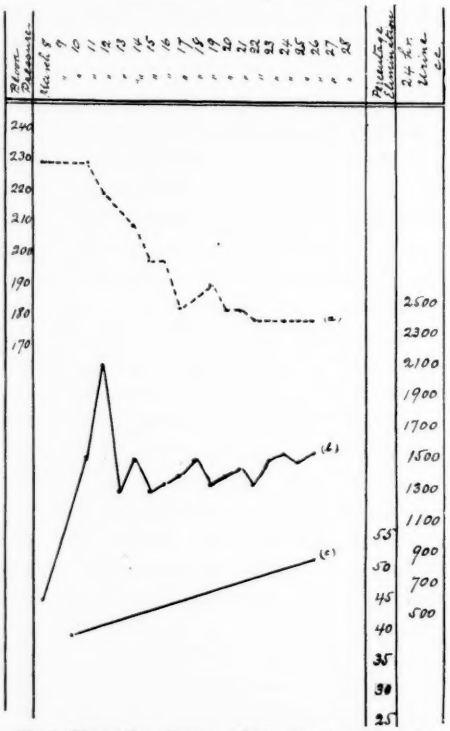

Chart illustrating diagramatically the influence of fiv grains *t. i. d.* of theocin on (*a*) blood-pressure, (*b*) excretion of urine, and (*c*) functional elimination. (Case 9.)

After treatment with theocin, 5 grains t. i. d., the quantity of the urine more than doubled, the functional elimination increased to 52 per cent, the specific gravity increased to normal, the blood-pressure gradually lowered to 180, and the improvement of the patient coincided with the results observed on both blood-pressure and elimination. (See chart.)

Case 10.—Male, aged twenty-three. Diagnosis: Subacute nephritis, hypotension.

The patient had lues and was treated with salvarsan several months ago. Following an operation for epididymitis he developed acute nephritis with edema. There were no changes in the heart. Urine was scant, albuminous, and contained an abundance of hyaline and granular casts. Blood-pressure ranged from 85 to 100. On March 16 the 24-hour urine amounted to 1400 Cc.; the functional elimination was 57.5 per cent and the blood-pressure 95.

Theocin, 4 grains t. i. d., was prescribed on March 20; on the 24th he voided 2500 Cc.; on the 25th the functional test was 54.5 per cent. The blood-pressure record showed an increase as follows: March 21, 98; March 22, 118; March 27, 125. The patient was discharged on the 28th much improved.

Case 11.—Male, aged fifty-nine. Diagnosis: Arteriosclerosis, chronic nephritis with uremic intoxication, hypertension.

Patient gave a history of rheumatism and malaria. He never used alcohol or tobacco. For the past four months he has had symptoms of chronic uremia, including indigestion, muscular cramps, dizziness, amaurosis, and temporary aphasia. The heart was moderately enlarged, a systolic murmur was heard over the pulmonary area, and the second aortic was accentuated. The blood-pressure ranged from 218 to 240. The urine had a specific gravity of 1012, and contained albumin, hyaline and granular casts. He voided 800 Cc. in twenty-four hours, with a functional elimination of 21 per cent.

After taking theocin, 5 grains a day, for five days the results were practically the same. The blood-pressure was 230, the amount of urine in twenty-four hours 1150 Cc., and the functional elimination 20 per cent. There was no improvement in the patient's condition.

Case 12.—Female, aged forty-eight. Diagnosis: Chronic parenchymatous nephritis.

She had periods of complete suppression of urine, associated with vertigo and headaches, and at times suffered from melancholia with periods, during which she showed suicidal tendencies. Recently she was taken with an acute exacerbation, in which she suffered from syncope, headache, vomiting, and muscular cramp.

The urine contained a large amount of albumin and hyaline and fine granular casts. The blood-pressure was 120. The daily amount of urine averaged about 1000 Cc.

Theocin was ordered in five-grain doses t. i. d. Two days later the quantity of urine increased to 2000 Cc. but the blood-pressure was unchanged. Five days later the blood-pressure increased to 125, and seven days later to 135. The functional elimination, which was 25 per cent, had increased to 30 per cent in five days. The patient's condition was improved.

Case 13.—Male, aged fifty-seven, teamster. Diagnosis: Chronic emphysema, interstitial nephritis, cardiac hypertrophy.

Patient gave a luetic history and suffered from occasional attacks of dyspnea and vertigo.

He was admitted to the hospital in one of the attacks. He had a barrel-shaped chest with hyperresonance and expiratory dyspnea, and an increased area of heart dulness extending 2 cm. beyond the left nipple line and 3 cm. beyond the right sternal border. There was a mitral systolic murmur and an accentuation of the second pulmonic sound. The arteries were thickened and the blood-pressure was 175. He excreted 900 Cc. of urine in twenty-four hours, which contained albumin and hyaline casts. The functional elimination was 40 per cent.

After the administration of theocin the amount of urine increased to 1300 Cc. The blood-pressure diminished on the second day to 160, the third to 158, and the eighth to 145, while the functional elimination remained the same.

Case 14.—Male, aged fifty-eight, manager of printing house. Diagnosis: Chronic interstitial nephritis, arteriosclerosis, hypertension.

Patient drank alcohol freely and ate excessively. Cough was the first symptom noted. The blood-vessels were tortuous and highly sclerotic and the heart was slightly enlarged. The blood-pressure was 220. There were no murmurs present. Seven hundred cubic centimeters of albuminous urine containing hyaline casts were excreted in twenty-four hours. He had a functional elimination of 29 per cent.

The first day after theocin was administered the blood-pressure was reduced to 200, and four days later to 160, where it remained. The amount of urine had increased to 1500 Cc. Subsequently it averaged from 1300 to 1500 Cc.

The functional test on the fifth day was 39 per cent. At the end of one week the patient's condition was very much improved.

Case 15.—Male, aged seventy-six, milk dealer. Diagnosis: Arteriosclerosis, cardiac hypertrophy, and renal insufficiency.

This patient had been a hard worker and a good eater all his life. For ten years he suffered severe pains in his back and thighs, and cramps in his calves, with occasional headache and vertigo. He drank beer moderately.

His left heart was hypertrophied and he had marked arrhythmia. There were no murmurs present. The arteries were very sclerotic and the blood-pressure was 195. He had some weakness in his legs and absence of the knee reflexes. In twenty-four hours he voided 2250 Cc. of urine with a specific gravity of 1024, containing hyaline casts but no albumin. The functional elimination was 45 per cent.

After taking theocin, 3 grains t. i. d., for one week he passed 2600 Cc. urine in eighteen hours. At this time the functional test showed an elimination of 52 per cent. The blood-pressure was 180. The pulse-rate was 72 and regular, and the cramps in his legs had disappeared, although he still complained of headache and vertigo. One week later he voided 2720 Cc. urine in twenty-four hours, which contained no albumin or casts. Blood-pressure was 168.

Case 16.—Male, aged sixty, policeman. Diagnosis: Aortic regurgitation with hypertension and albuminuria.

Two years ago he began to suffer with dyspnea, which gradually became worse. The heart was enlarged, and the liver extended to two fingerbreadths above the umbilicus. There was some arteriosclerosis, and the blood-pressure was 220. He voided 750 Cc. urine in twenty-four hours, which contained albumin but no casts. The functional test showed a total elimination of 25 per cent.

After the administration of theocin, 4 grains t. i. d., the quantity of urine doubled. The blood-pressure was reduced to 205, and the heart and liver were diminished in size.

Four months later the patient again reported for examination. He then was voiding 420 Cc. urine in twenty-four hours, with a specific gravity of 1016, and albumin and hyaline casts positive. The systolic pressure was 202 and the diastolic 140. Cardiac dulness was increased to both right and left, and there was a double aortic murmur. The patient was restless, dyspneic, and unable to sleep. The functional test at this time showed a total elimination of 31 per cent. After further administration of theocin, 5 gains t.i.d., he rapidly improved, the dyspnea disappeared, and he slept much better. He voided 1600 Cc. urine in twenty-four hours with a specific gravity of 1016. The pulse, which was at first irregular, became regular. After taking theocin eight days the functional test showed a total elimination of 36 per cent. The systolic pressure fell to 185 and the diastolic

to 108. This patient has improved so that he is now able to do light work.

Case 17.—Male, aged seventy-nine, machinist. Diagnosis: Chronic interstitial nephritis, hypertension, myocarditis.

At the age of sixty-eight he had pleurisy with effusion; otherwise his health has been good. He was taken sick suddenly in April, 1913. The chief symptoms were headache, backache, and dyspnea. Examination in August, 1913, showed marked pallor, arteriosclerosis, cardiac hypertrophy, double mitral and aortic murmurs. The blood-pressure was 245. The urine contained granular casts and albumin. The total functional elimination was 12.5 per cent.

After taking theocin, 4 grains t. i. d., for ten days the blood-pressure was 225, and there was a marked general improvement.

The patient did not report for further examination.

Case 18.—Male, aged forty, porter. Diagnosis: Arteriosclerosis, myocarditis, chronic interstitial nephritis, hypertension.

He had had gastrointestinal symptoms for years. These became worse about fourteen months ago; since then he lost 60 pounds. At first the chief complaint was shortness of breath on exertion, but for the past six weeks he was orthopneic and had a cough. He had headache, backache, cramps in the legs, and edema of the feet the past four months. He was anemic, the arteries were sclerosed, and the heart and liver were both much enlarged. There was a mitral systolic murmur. The blood-pressure was 270. In twenty-four hours 3500 Cc. urine was excreted, which had a specific gravity of 1030 and contained a large amount of albumin, hyaline and epithelial casts. The total elimination was 18.75 per cent.

The general condition improved and the blood-pressure was reduced to 240 after a week's administration of theocin, 4 grains t. i. d. A month later, while taking the same dose of theocin, the blood-pressure was reduced to 200 and the total functional elimination was 17.5 per cent. This patient subsequently died of uremic intoxication.

Case 19. — Female, aged twenty-two. Diagnosis: Chronic interstitial nephritis, hypertension.

For several months she had complained of headache, backache, and vertigo. She voided 2250 Cc. urine in twenty-four hours having a specific gravity of 1008 and containing a trace of albumin and a few hyaline casts. The systolic pressure was 230, the diastolic 140. The functional elimination was 49 per cent.

After taking theocin, 4 grains t. i. d., she began to improve. The systolic pressure decreased to 202 and the diastolic to 138. After administering theocin for nine days, the functional elimination was 44 per cent, the systolic pressure 218 and the diastolic 140. The urinary excretion remained the same.

On further administration of the drug, there was no apparent improvement.

Case 20.—Male, aged fifty-four, station master. Diagnosis: Chronic myocarditis, hypertension.

His previous health was good, but recently complained of dyspnea, frequent micturition, slight edema of feet and eyelids, and muscular cramps. There was some enlargement of the heart with a mitral systolic murmur and an irregular, intermittent pulse.

The blood-pressure was 185. He voided 400 Cc. of urine in twenty-four hours, which had a specific gravity of 1021 and contained hyaline casts, but no albumin. The total elimination was 75 per cent.

After taking four grains of theocin t.i.d. for six days, his general health was much improved. He had less dyspnea, his heart was more regular, and the blood-pressure was 155.

Case 21.—Female, aged sixty-three. Diagnosis: Chronic interstitial nephritis, hypertension.

For the past year patient had complained of vertigo and of pain in her feet. The blood-pressure was 190. There was a slight enlargement of the heart, and a mitral systolic murmur. The urine was diminished in quantity and contained albumin, hyaline and granular casts.

After the administration of theocin, 4 grains, t. i. d., the urine increased to normal in amount and the blood-pressure fell to 160.

When theocin was reduced to one dose per day the blood-pressure increased to 170, but the vertigo had subsided. No functional test was made.

Case 22.—Female, aged fifty-five. Diagnosis: Chronic interstitial nephritis, arteriosclerosis, fracture of neck of femur.

She complained of dizziness, palpitation, and syncopal attacks. She had an enlargement of the heart, a functional aortic murmur, and sclerotic vessels, with a systolic pressure of 218 and diastolic pressure of 284. She voided 20 Cc. urine in twenty-three hours, which contained albumin and granular casts. The functional test showed an elimination of 45 per cent.

After the administration of theocin, 5 grains t. i. d., for five days the systolic pressure was 182, and the diastolic was 90. The urine at this time was free from casts but contained albumin. and her general condition was much improved.

Case 23.—Female, aged twenty-four. Diagnosis: Chronic interstitial nephritis and mitral regurgitation.

Patient was nervous, restless, and sleepless, and complained of palpitation. She had a mitral regurgitation. She voided 1750 Cc. of urine in twenty-four hours, which contained a small amount of albumin, and few casts. The systolic pressure was 162, the diastolic 112. The functional test was 47 per cent.

After the administration of theocin, 5 grains t. i. d. for five days, the functional test was 60 per cent, the systolic pressure 158, and the diastolic 96. One week later the urine was negative for albumin and casts, and the patient was discharged free from all symptoms.

The above clinical observations are insufficient to make any very definite deductions. One is impressed, however, with the fact that the blood-pressure decreases in a fair ratio to the increase in the amount of urine excreted and the general improvement of the patient.

There does not seem to be any definite relation between the lowering of blood-pressure and the functional elimination of phenolsulphonephthalein.

This does not necessarily indicate that the beneficial results of theocin are not due to the elimination of toxic products.

Case 10 is one of unusual interest, owing to the fact that the blood-pressure increased from 85 to 125, with the increase in the amount of the elimination of urine. This remarkable improvement can only be explained on the principle of elimination.

It has been observed, in studying the toxicity of the urine, that certain substances can be isolated which have a powerful influence in increasing blood-pressure, whereas, on the other hand, substances have been isolated which have a correspondingly depressing action. This somewhat resembles the conditions met with in Graves's disease, in which, as pointed out by Karl von Noorden, two well-defined symptom-groups are recognized: the vagotonic, which are hypertensive, and the sympathicotonic, which are hypotensive—both are unquestionably toxic manifestations. Unless these metabolic poisons can be prevented or chemically neutralized, the natural recourse must be toward elimination.

* * *

I desire to express my appreciation for assistance given me by Dr. Harry L. Brillhart of the Mercy Hospital, and by Dr. M. B. Levin of the Hebrew Hospital, in the study of these cases.

EMERGENCY TREATMENT OF RUPTURED UTERUS AND RUPTURED ECTOPIC PREGNANCY.[1]

BY RICHARD C. NORRIS, M.D.,
Physician-in-charge of the Preston Retreat, Philadelphia.

The obstetric emergencies—rupture of the uterus and of ectopic pregnancy—chosen for a brief discussion before general practitioners practically becomes a discussion of the conservative *vs.* the radical treatment of these two conditions.

Rupture of the uterus is said to occur once in from 1000 to 4000 labors. Untreated the maternal mortality is 90 per cent, the infant mortality 95 per cent. Under appropriate treatment the mortality has been reduced to 50 or 60 per cent. The extent of the rupture, the amount of the hemorrhage, the time elapsed before treatment begins, and the skill of that treatment—all determine the outcome, which at best is not far from a 50-per-cent mortality. I propose to ignore the infrequent rupture that occurs during pregnancy or the first stage of labor, due to inherent defects in the uterine wall. My remarks will include only the accident as it occurs during actual labor. The rent that usually begins in the lower uterine segment due to obstruction of the passage of the fetus may reach to any extent, depending upon the violence of the traumatism which usually causes it. Excessive thinning of the lower uterine segment is the predisposing cause; bad obstetrics is almost always the exciting cause. The abuse of ergot formerly was named as a cause; the use of pituitrin will doubtless assume this rôle in the near future. The violence of operative procedures when the uterus is firmly contracted, or failure to recognize an obstacle to labor, has been the cause, with one exception, of all the cases of rupture during labor seen in twenty-five years of active obstetric work. The relative frequency of spontaneous and traumatic ruptures is stated to be about equal.

Attempts at contraindicated version or forceps have been the causes in the cases that have come to my notice. When a multipara suddenly recognizes a sharp tearing pain, and labor pains cease abruptly, accompanied by the rapid appearance of signs of hemorrhage and shock; when after attempting version for a cross-birth the patient falls into collapse, the merest tyro in obstetrics should recognize at once this most serious calamity of labor with its high mortality from hemorrhage, shock, and sepsis.

I take it that my remarks are meant for the general practitioner who meets this calamity at the bedside of his patient in her own home. The indications are to deliver the child and control hemorrhage and prevent infection. That sounds fairly simple and easy, but such is not the case. The best way to meet this emergency has not even been settled by obstetric experts. My advice to the man of average experience with operative obstetrics is to weigh carefully the well-known danger of moving the patient to a hospital, to note the degree of shock and collapse, and if provided with the means of surgically clean work, to examine carefully to learn the location and extent of the rupture and decide whether he is capable of delivering the patient and applying the conservative treatment by tampon. This work demands the best surgical technique.

Like all the emergencies in obstetrics, if the first aid fails to protect from infection, the subsequent skill called to the case may utterly fail to save the patient. Even temporary control of hemorrhage cannot be accomplished until the child is delivered. He must decide at once whether the child is alive, which is unusual, whether the greater portion of it is still within the uterus. Before the delivery of the fetus the degrees of hemorrhage and laceration may be very difficult to determine. If the greater part of the fetus has escaped into the abdomen he knows at once that nothing short of an abdominal operation can be

[1]Read before the Philadelphia County Medical Society as a part of a symposium on Emergencies, April 28, 1915.

considered, and treatment in the hospital offering the promptest aid is necessary. Let us suppose that the child is still in the uterus, and that the rupture has occurred during attempts at delivery, which is so often the case, and which especially happens during an unwarranted version. If the head is within reach apply forceps, perforate the skull of the dead fetus, and carefully extract it. Deliver the placenta manually at once. Explore the rent carefully to avoid converting an incomplete into a complete rupture. Firmly tampon the rent, after applying tincture of iodine; then the entire uterine cavity and vagina should be firmly plugged. If the laceration is on the anterior wall, suspect injury to the bladder. Hold the uterus anteflexed by a firm abdominal binder and pad. If the rent is on the posterior wall, retroflex the uterus and hold it thus by the pad and binder. If the bladder has been torn introduce a self-retaining catheter. Freely stimulate the patient only after reaction has appeared, giving first and at once salt solution in moderation by hypodermoclysis and enteroclysis. The tampon in the uterine rent may remain in place not less than seventy-two hours, when it may be gently removed and if necessary replaced.

The danger of transporting a patient with rupture of the uterus is a very grave one, and the statistics of treating incomplete rupture and small complete ruptures warrant this conservative treatment at the bedside of the patient, in clean cases treated by a clean obstetrician. Cases very badly shocked from great loss of blood show a high mortality from operative treatment, and this conservative treatment, temporarily used, may make operation after reaction much safer in such cases. Escape of the fetus into the abdomen, very free bleeding and extensive laceration of the uterus through its peritoneal coat always call for an immediate section, and the risk of transportation must be taken in these cases. Cases that come to section may sometimes be safely treated by suture of the uterus, but usually will be more safely treated by hysterectomy, and the cervical stump should be made extraperitoneal by suture in the lower angle of the abdominal incision if the prior handling of the case presupposes infection.

Rupture of the uterus, promptly in the hands of an expert obstetric surgeon with his hospital environment, will usually be treated by section. In the hands of the average man the surgically clean tampon shows remarkably good results.

In a series of 140 cases, 97 treated without operation show a mortality of 61 per cent; 33 cases treated by hysterectomy, 36.6 per cent mortality (Kalomenkin, *Monatsschr. für Geburts. Gyn.*, 1903, Bd. 17, p. 345). In another series (*Klin. Archiv für Gyn.*, 1901, Bd. 62, p. 193) of 65 cases treated by tampon the mortality was 52 per cent. In still another (Lobenstein) of 14 cases plugged, the mortality was 92 per cent. Various statistics of operated cases give a mortality ranging between 25 and 50 per cent.

It is impossible to prove the merits of either plan of treatment by statistics. Presumably the milder cases have been more frequently treated by the tampon and the more serious ones by section. I still feel, however, that the tampon treatment in the hands of general practitioners is the elective one for the average case.

Ectopic Pregnancy. — Contrasting the conservative treatment of ruptured ectopic pregnancy with the prompt surgical treatment by laparotomy, there is in my judgment less to be said in favor of conservative treatment. A diffuse hematocele of small size that sometimes follows tubal abortion from the fifth to the seventh week, in which a tubal mass cannot be felt, and the clinical signs of continued bleeding are not present, may be treated expectantly with the hope of ultimate absorption of the blood mass, but these cases are rare, and my experience teaches me that almost without exception ectopic pregnancy should be treated by laparotomy without undue haste in the preparation for an aseptic section. Penknife surgery is not called for. Intravenous transfusion of salt solution even during transit to hospital in the

ambulance has saved many desperate cases in my hands. The vaginal route is too uncertain; it often will necessitate more destructive surgery than the abdominal operation to properly control bleeding. The former very frequent resort to drainage and long-continued flushing of the abdomen should be abandoned. A quick, clean exsection of the offending tube, removal of the large blood-clots by sponging, and rapid closure without drainage is the usual operation of choice. The mortality rate of ectopic pregnancy under surgical treatment varies from 3 to 4 per cent.

OCCIPITOPOSTERIOR POSITIONS.

BY J. B. LUKINS, M.D., LOUISVILLE, KENTUCKY.

Notwithstanding the numerous theories which have been advanced by different authors in attempted explanation of the fact that in about ninety-seven per cent of instances, at the termination of normal uterogestation, the fetus presents in the vertex position, there is still no consensus of opinion as to why this should be true, nor is there anything definitely known concerning the subject. The three most reasonable etiological factors suggested are: (*a*) the effect of gravity; (*b*) the easier adaptation of the fetus (to the uterine cavity) in the vertex position; and (*c*) the effect of active fetal movements. It is quite probable that in a combination of these three factors may be found the true explanation of the preponderance of cephalic presentations.

(*a*) It has been experimentally shown that if a full-term still-born fetus be immersed in fluid the specific gravity of the liquor amnii, under the influence of gravity it assumes an oblique position—*i.e.*, the head lower than the breech, and the right side lower than the left. In proportion to its size the head is heavier than other parts of the fetal body, and the greater weight of the right side is due to the enormous relative size of the liver.

(*b*) While it may be untrue in the earlier months, with progression toward termination of uterogestation, the uterus assumes a distinctly pyriform contour, being then but little larger than the fetus, and seems better adapted to the shape of the fetus in the cephalic position than otherwise. For example, when the fetus assumes a transverse position during the later months of pregnancy the lower and narrower segment of the uterus is subjected to inordinate tension, and the upper wider segment being unduly relaxed there is a tendency for the rhythmical uterine contractions to restore the fetus to the cephalic position. The shape of the uterus and its adaptability to the contour of the fetus may therefore be presumed to have a definite bearing upon maintenance and restoration of the vertex position.

(*c*) The fetal movements probably have less influence upon preservation of the cephalic position than the two foregoing factors, and in exceptional cases in which there exists undue relaxation of the uterine walls with feeble contractile power, if the fetus has assumed a transverse position, restoration is unlikely to occur. However, with normal contractility of the uterine musculature, fetal movements may be of assistance in correcting the abnormal position.

The occipitoposterior position occurs in approximately one-third of all vertex presentations, and in about eighty-five per cent of these the presentation is R. O. P., in fifteen per cent L. O. P. The preponderance of right occipitoposterior positions may be readily understood when one considers the anatomical conformation and relationship between the maternal and fetal parts.

The diagnosis of occipitoposterior position of the presenting fetus entails no especial difficulty when labor has advanced sufficiently far for the head to be engaged

in the superior strait. During the last few weeks preceding delivery, however, changes in position of the fetus may be quite frequent. The methods by which accuracy in diagnosis may be assured are: (*a*) abdominal inspection, (*b*) palpation, (*c*) auscultation, and (*d*) vaginal examination.

(*a*) Abdominal inspection at the beginning of labor will sometimes be of assistance in excluding transverse presentation and multiple pregnancy, but is otherwise of little value.

(*b*) By carefully palpating the lower uterine segment it is usually possible to determine the exact position of the fetal head in all vertex presentations, but such manipulation is permissible only during the intervals between contractions, and undue force must not be applied. The vertex position is readily confirmed by fundal palpation to locate the fetal soft parts.

(*c*) Cephalic presentation may be further confirmed by careful abdominal auscultation, thus determining the situation in which the fetal heart sounds are most distinctly heard.

(*d*) The most valuable information concerning the exact presentation is afforded by vaginal examination after the head has engaged and is pressing upon the pelvic floor. Although the cervix be not at the time entirely obliterated, the presenting part may usually be recognized by careful examination, and after dilatation is complete there is little likelihood of diagnostic error as the fingers may be then brought into direct contact with the fetal outlines. If the position be occipitoposterior, either O. D. P. or O. L. P., the anterior fontanelle is always within easy reach of the examining fingers, and recognition of its exact location furnishes absolute evidence of diagnostic accuracy.

The management of the second and third stages of labor, where the fetus presents in the occipitoposterior position, is oftentimes fraught with considerable difficulty and increased danger to both mother and child. The first stage is almost invariably unduly prolonged, probably because (*a*) of inefficient uterine contraction from deficient reflex stimulation, descent of the head being thus sometimes considerably delayed, and (*b*) because engagement of the head at the pelvic brim is more difficult than in anterior positions.

Entrance of the head into the pelvis is mechanically easy in anterior positions, but in the O. D. P. its wide biparietal diameter is opposed to the narrow oblique space between the sacral promontory and the iliopectineal eminence, while the narrow biparietal diameter fits loosely into the wide space afforded by the anterior portion of the pelvis. "Two factors of difficulty are thus produced: (1) The widest portion of the fetal head finds itself in apposition with a narrow portion of the pelvis, and therefore requires a powerful driving impulse to force it through the brim; (2) this retarded widest portion of the head is situated on the occipital end of the head lever, while the sincipital end is almost free. This situation, therefore, always tends toward a too rapid descent of the sinciput—that is, toward the production of extension—but the degree of extension produced varies with the relative sizes of the pelvis and the head."

If the disproportion between the biparietal diameter of the head and the pelvis is slight, sufficient extension may occur to cause the forehead to press against the pubes, and resistance being thus equalized greater propulsive force may be directed toward the occiput and descent accomplished with the sinciput above the brim, the head passing the sacral promontory fairly well flexed; but if the disproportion is more extreme extension may continue until the occipitofrontal diameter occupies the first oblique diameter of the brim. The head may then pass the brim in an extended position, or may be arrested and become a brow presentation, or may exceptionally be converted into a face presentation.

Extension should therefore be prevented until flexion can be secured. In certain rare instances, if proper flexion can be maintained, delivery may be accomplished with practically as equal facility as when the presentation is normal—*i.e.*, O. D. A.

As a rule, however, extension progresses until the head presses firmly against the perineum, and rotation becomes necessary before delivery can be completed. In making this statement the pertinent fact has not been overlooked that in a certain unknown percentage of cases, even after the diagnosis of occipitoposterior position has been made, rotation is accomplished by the natural maternal forces without extraneous aid, the posterior position being converted into normal—*i.e.*, O. D. A. or O. L. A.

There has hitherto existed considerable confusion in regard to the terms version and rotation when applied to the management of labor with cephalic presentation in the occipitoposterior position. While it may be true that literally both words signify "a turning" or "change in position," the use of version should be restricted to the act of turning the fetus while still free in the uterine cavity, and rotation used to denote changing the presentation of the fetus after the head has actually become engaged in the superior strait. Under this distinctive interpretation, version would imply that the fetus must still be free within the uterine cavity, but the statement is commonly observed in obstetric literature that "version was practiced" during the last stage of labor, a vertex presentation being converted from occipitoposterior to normal, the terms version and rotation being thus synonymously utilized.

The ideal plan of management in occipitoposterior positions, provided the patient can be seen and the diagnosis made sufficiently early, is to hasten cervical dilatation by manual means and accomplish immediate version by the combined internal and external method—*i.e.*, by introducing one hand into the uterus and grasping the fetal head, the other hand assisting in the process by external manipulation. After the head is partially engaged at the pelvic brim, properly directed pressure against the occiput from below upward may cause sufficient recession and delay in descent to enable the operator to correct the faulty position by version. Where version is possible, it is my belief that it should be practiced, as experience has shown this to be the safer plan from the standpoint of both mother and child.

In the event labor has progressed until the head has entered the superior strait and is firmly engaged, rotation must be substituted for version. Rotation may be accomplished by either manual or mechanical means, the former being preferable to the latter under ordinary circumstances. In some instances, however, manual rotation cannot be effected, and resort must be had to mechanical means—*i.e.*, the application of forceps with the head in the abnormal position. The most important factors in attempting to secure manual rotation are: (*a*) to preserve flexion, and (*b*) to discourage extension while the head remains in the faulty position. By having the patient temporarily assume the knee-chest or lateral posture, thus favoring muscular relaxation, flexion and rotation may be encouraged by pressing upward upon the fetal forehead with the fingers introduced within the cervix, the other hand exerting external pressure in the proper direction upon the abdomen. Failure may be expected from the application of this method unless flexion can be maintained and extension temporarily prevented. Even where firm engagement of the head has ensued, rotation may still be possible by mechanical means, but this method is more difficult and entails greater risk, especially to the child.

The high application of forceps and rotation is one of the most arduous procedures in obstetrical practice, especially when the fetus is in greater or less degree impacted in the pelvic outlet. After application of the forceps, efforts toward rotation should be confined to the intervals between contractions, otherwise damage may be inflicted upon both the maternal and fetal structures. This is a danger which has been insufficiently emphasized in text-books and elsewhere, and especially does this statement apply to the fetus—*e.g.*, it is not unknown that the fetal head has been "literally twisted from the body" by too vigorous efforts in attempting rotation by means of the

obstetric forceps! If too great force be not applied where there is a tendency toward rotation, and if manipulations be suspended during each contraction, the dangers are minimized. Contrary to the opinions of certain other authors, the solid blade forceps are believed inappropriate for this purpose because of insecurity and tendency to slip, therefore the fenestrated blades should always be used. The instrument may be removed and reapplied as often as may be necessary, provided in the judgment of the operator rotation can finally be accomplished.

In a certain percentage of instances all efforts to rotate are futile, and delivery must be promptly completed by instrumental means with the head in the abnormal position. It seems the height of wisdom to not persist in the attempt to rotate until the patient shows evidence of marked exhaustion, more especially as inordinate delay also subjects the child to additional danger, as illustrated by the outcome in one of my cases.

After a reasonable time has elapsed, if no progress toward rotation ensues, it is imperative that the patient be anesthetized and instrumental delivery immediately accomplished. Care must be exercised to apply the forceps to the sides of the pelvis, with the blades equidistant from the occiput to sinciput, otherwise if the instrument slips serious damage may be inflicted upon the fetal head. One should imitate the process of nature in effecting extraction—that is, gradually bring the head downward until the sinciput at about the anterior fontanelle impinges upon the maternal symphysis, when it will be found in the majority of instances that the occiput may be carried over the perineum with comparative safety. Traction should therefore at first be made downward and outward, then forward and upward until the occiput passes over the maternal perineum. Despite the utmost care, however, more or less extensive vaginal and perineal laceration is more likely to occur than during instrumental delivery in anterior positions. Certain authors have suggested the advisability of bilateral colpotomy to prevent perineal laceration during delivery in the persistent posterior position, but as the perineum is not invariably injured such a procedure seems at least ill-advised.

During the last few years I recall having encountered but two difficult cases of occipitoposterior position. The first was in a primipara nineteen years of age, a very small woman whose tissues were exceedingly inelastic and resisting; the second was in a 12-para whose tissues were extremely relaxed and flaccid. In neither case did the patient come under my observation until labor had advanced to the stage where version and rotation were impracticable by manual means, and instrumental measures had to be applied.

In the first case the child was dead when delivery was finally accomplished, and I now realize that completion of labor was too long delayed after the diagnosis had been made. Had forceps been applied earlier the life of the child might have been saved. It was this experience which caused me to state in the foregoing that prolonged efforts to rotate were inadvisable. If it appears that the head cannot be rotated, or that the process of rotation will be unduly prolonged, the patient should be anesthetized and delivery completed. In this case the patient was a primipara, the occiput failed to rotate, finally forceps were applied and the head partially rotated, then removed and reapplied, the child being dead when extracted.

In the second case the patient was forty-one years of age, and I was called to deliver her thirteenth baby. According to the history obtained, at about the fifth month of uterogestation the woman was riding in a vehicle which collided with a street-car, and she was thrown to the ground, but so far as I could determine no injury was sustained. I did not see the patient, however, until the termination of her pregnancy. She said there had been no difficulty whatsoever in any of her previous labors. The occipitoposterior position of the fetus was readily recognized when the first examination was made. The patient was immedi-

ately anesthetized and delivery of a living child accomplished after considerable difficulty. She subsequently brought suit against the railway company, and of course I was called to testify at the trial. These questions were asked:

Q. Did you have very much trouble in delivering this woman? A. I did.

Q. Did the accident have anything to do with it, and is it a fact that this was the cause of the difficulty you experienced in delivering this woman? A. I do not consider that the accident had anything whatever to do with the difficulty in delivery.

Of course I did not attempt to explain the etiological factors which might be concerned in the production of occipitoposterior positions, but merely stated that I could see no reason for attributing the position of the fetus in this case to the fact that the woman had been "knocked off a wagon" at about the fifth month of pregnancy. From my experience and the information I have been able to obtain from the literature of the subject, there was nothing to justify such a conclusion. The relaxed abdominal muscles and large size of the uterus probably had more to do with the position of the fetus than the accident.

In both these cases the diagnosis was easily made, and in neither was there any extensive laceration of the vagina or perineum during delivery, although in each case labor was completed by the application of forceps before the head had completely rotated.

THE INTRAVENOUS AND INTRAMUSCULAR ADMINISTRATION OF DIPHTHERIA ANTITOXIN.

VEEDER, in the *Journal of the Missouri State Medical Association* for April, 1915, reminds us that there are three methods of administration of antitoxin—the subcutaneous, the intramuscular, and the intravenous. Park has shown that there is a marked difference in the amount of antitoxin in the blood stream following subcutaneous and intravenous injections. Of two children given equal amounts of antitoxin, one will have twenty units of antitoxin per cubic centimeter at the end of six hours if the intravenous method is used, and the other only two units per cubic centimeter if the antitoxin is given subcutaneously. At the end of twenty-four hours there are twelve units for the intravenous method against six for the subcutaneous; by the third day the two are equal, and from then on the quantity in the child injected intravenously is less.

J. H. Smith and others have also noted the high concentration with a rapid fall following intravenous injections. According to Smith but one-third of the original amount is left at the end of twenty-four hours. The curve of absorption of antitoxin given subcutaneously rises slowly, not reaching its maximum until about the third or fourth day. At about the fourth day the active production of immune units by the body in cases in which a lethal dose of toxin has not been absorbed begins to make itself felt, and by the sixth day the antitoxin content is much higher in some cases than the total amount of antitoxin given.

The increased rate of absorption of colloidal substances injected into muscle tissue over colloids injected subcutaneously has been shown by Morgenroth and Levy, Lemaire, Karasawa and Schick, and others. Morgenroth found that four or five hours after injection there was from five to twenty times as much in the blood when the antitoxin was given intramuscularly as when given subcutaneously, and that in seven or eight hours there was from three to ten, and after twenty-four hours five times as much. From these figures it will be seen that intravenous and intramuscular injections are to be preferred to subcutaneous, as a high concentration of antitoxin in the blood stream can be obtained in a few hours, while subcutaneously the maximum effect is not reached for three or four days. For this reason the same results will be obtained from a much smaller amount of antitoxin if the intravenous or intramuscular method is used.

Both the intravenous and intramuscular methods of administration have been used clinically in the past and their advantages ırged by a number of authors, but for some

reason the subcutaneous method is employed in about ninety-nine out of every one hundred cases. The writer has used both the former methods quite extensively at the Children's Hospital in the past three years on a group of cases which were selected for their severity, as the accommodations for treating diphtheria have been limited until recently, and a large percentage of the cases admitted were septic or had a laryngeal involvement. In almost all of the laryngeal and in some of the more severe pharyngeal cases he has given from 2000 to 5000 units of antitoxin intravenously. The difficulty of injection has been urged against this method, but he feels this has been overestimated. He uses an antitoxin of high concentration—1200 to 1400 units per cubic centimeter—which is diluted one to four, heated to body temperature, and injected into any available vein with an ordinary glass syringe. In fat babies, where the vein at the bend of the elbow is not easily found, he injects directly into the external jugular. In a number of cases the injection has been followed by a severe chill with rise in temperature and rapid pulse, in from ten to thirty minutes after the injection. One or two adults of the house staff who have been given antitoxin intravenously have been nauseated and have complained of intense headache. In every instance, however, the temperature has fallen to normal by the next day and the patient has been free from all signs of toxemia. It has seemed to the writer that the membrane has sloughed off more rapidly following the intravenous injections, but no effect has been noted on the time in which the throat became free from the diphtheria bacillus. The intramuscular injections have been almost equally efficient from a clinical point of view. The reaction is much less severe than that following intravenous injections and the injections apparently are no more painful than those given subcutaneously. The writer has used both the spinal and gluteal muscles as the site of the injection, and has adopted the intramuscular injection as the routine procedure in the average case.

The question of the amount of antitoxin to be given has been the cause of much dispute. The earlier dosage of 1000 to 2000 units subcutaneously was too small. On the other hand quantities of 30,000 to 40,000 to even 100,000 units are entirely unnecessary. These large doses have all been given subcutaneously, and Woody, who recently advocated large doses of antitoxin from his experience at the Municipal Hospital of Philadelphia, paid no attention to the time element or to the method of administration. The large doses which have been used by some are in many instances the result of using repeated injections. From what has been said it will be seen that it is not the total amount of antitoxin given which counts, but the rapidity with which antitoxin is thrown into the blood stream to neutralize the absorbed and forming toxins. Repeated injections add to the concentration in the blood too late to be of service, and if sufficient antitoxin does not enter the blood stream from the first injection a second will be of no avail.

There is no way at present by which the amount of toxin present in an individual case can be ascertained; hence the amount of antitoxin to be given can only be reached in an empirical manner. Attempts to base the amount to be given on the body weight are fundamentally wrong, as two children of the same body weight may absorb entirely different amounts of toxin, or the toxin absorbed may be of a different potency. The writer does know that smaller amounts of antitoxin given intravenously or intramuscularly are equal to much larger amounts given subcutaneously. Park states that 5000 units given intravenously are equal to 20,000 given subcutaneously. The writer now gives from 3000 to 5000 units, and had no better results when 10,000 units were given as a routine dose. He, personally, believes that as far as the antitoxin part of the treatment is concerned 2000 to 5000 units given intramuscularly or intravenously will cure any case of diphtheria in which the lethal dose has not already been absorbed before the time of injection.

EDITORIAL.

POSTURE IN RELATION TO GENERAL ANESTHESIA.

Some months ago we called attention to the subject covered by the above inscription, pointing out that, particularly in those persons who have a large abdomen, the absolutely prone, or Trendelenburg, posture is not only to be condemned on general principles, but is capable of producing serious complications. Our readers will therefore be interested in a paper upon this subject which is contained in the *Clinical Journal* of April 7, 1915, prepared by McCardie, a writer whose contributions on this subject we have quoted more than once in previous years. He states that variation in posture may affect respiration through either the air-passages or the lungs themselves; it may affect this circulation by its influence on the heart's action and also upon the blood-vessels; it may affect the nerves, particularly those of the limbs; and cause strain of the muscles and joints, thereby inducing post-operative aches and weakness. Finally, certain postures may affect the internal organs, as, for example, the stomach, intestines, or kidneys.

An important point emphasized by McCardie, but almost universally ignored by anesthetists, is the placing of the patient in a position as nearly as possible like that in which he or she would lie in going to sleep. Thus a healthy sleeping child commonly lies on its side more or less curled up with all its joints moderately flexed. This is a natural position, the position of greatest ease, and the best for anesthesia, and, even if the necessities of operation require a dorsal position, there is usually no reason why a natural position should not be assumed at least until the operation is begun. The more relaxed the joints in partial flexion the less danger is there as to strain and injuries. McCardie also thinks that in operations upon the upper parts of the body, when the nature of the anesthetic or the needs of the operator do not contraindicate it, it is wise to have the head and shoulders slightly elevated to lessen oozing and to decrease the amount of anesthetic to enter the lungs if the upper respiratory passages are not filled with secretion. In operations upon the head elevation tends to diminish hemorrhage. The use of chloroform in the majority of cases is dangerous if the patient's head is elevated, and particularly dangerous if he is sitting up in a chair. In operations upon the breast it is pointed out that the arm should never, or for as short a time as possible, be extended beyond a right angle to the body, particularly in stiff-built, fat people, because of the danger of brachial paralysis.

McCardie is one of those who is fully alive to the danger of the Trendelenburg posture, and quotes Kocher as saying "a man cannot be expected to stand on his head for over half an hour without his circulation being seriously affected." These people and those who suffer from diseases of the heart or vessels can often obtain sleep without respiratory embarrassment only when the shoulders and head are raised. Franz, who has studied the behavior of respiration and circulation when the patient is in the Trendelenburg posture, found that even without the use of an anesthetic the abdominal respiration was constantly weakened and thoracic breathing not materially increased by way of compensation. In other words, the raising of the pelvis diminishes the ventilation of the lungs, and if a patient in the Trendelenburg posture is suddenly raised to the normal position there is, with the first breath, marked lessening of both abdominal and thoracic breathing.

It is only fair to state, however, that Franz believes that a patient under chloroform in the Trendelenburg posture suffers little damage, but probably this is due to the fact that the safety of his vital centers, under a drug which is so depressant to the circulation, is advantageous. Ether induces bronchitis in patients placed in the Trendelenburg posture considerably more fre-

quently than in those who receive the drug when in a horizontal position. McCardie quotes Wilson of Birmingham as reporting 144 cases subjected to gynecological operations in the horizontal posture with 7 pneumonias, whereas there were 10 pneumonias in 144 cases subjected to the Trendelenburg method. So, too, Franz in 825 cases of ether narcosis in the dorsal position had 19, or 2.3 per cent, patients with bronchitis, whereas in 493 cases in which the pelvis was raised there were 44 instances, or 8.9 per cent, of bronchitis. In 150 chloroform narcoses in the dorsal position there were 4, or 2.7 per cent, cases of bronchitis, and in 233 cases in the Trendelenburg posture there were 9, or 3.9 per cent, showing somewhat different results between ether and chloroform. Franz thinks that the ether causes a greater amount of secretion, which trickles down into the bronchi and infects the lungs.

Zweifel had 18 deaths from pulmonary embolism in the Trendelenburg posture in 1800 cases. Later he no longer kept the patient's legs flexed and firmly bandaged, and had the shoulders supported and resorted to the Trendelenburg posture as seldom as possible; and in the next 800 operations there were only three deaths from this cause.

The Trendelenburg posture is thought by some to increase the danger of intestinal obstruction, surgical emphysema, apoplexy, and acute postoperative dilatation of the stomach.

Bovée found that in eight cases of ether anesthesia and in eight cases of chloroform anesthesia almost no urine was received in the bladder while this position was maintained, which possibly may indicate that when the kidneys are impaired this posture is a special element of danger.

Finally, McCardie quotes Gatch, Gann, and Mann, who believe that there is no more certain way of killing a fat woman than by leaving her for some time in the high Trendelenburg posture.

Experiments upon dogs that have never had a full abdomen showed marked changes in the circulation when the inverted posture was maintained. Nearly thirty years ago Martin and the writer showed that such a posture is fatal to rabbits by disturbing the abdominal circulation and throwing too great a pressure upon the diaphragm.

THE VALUE OF STRYCHNINE IN BROKEN CARDIAC COMPENSATION.

There are few drugs which are so generally employed by the profession by the mouth or hypodermic needle as is strychnine, which is another way of expressing the fact that a large number of physicians believe that it has rendered them excellent service. When the vast body of the profession reaches such a belief it is difficult to accept the statement of any one individual, or of several individuals, that good results are not in reality produced by this drug when it is properly used.

As our readers know, a number of papers have appeared, comparatively recently, some of which have seemed to indicate that digitalis does not raise blood-pressure and that alcohol is of no value; and now we have a paper, appearing in the *American Journal of the Medical Sciences* for May, 1915, by Newburgh of Boston, in which he studied eight cases of ruptured compensation as to the influence which strychnine would produce. His conclusions are that neither pharmacological nor clinical evidence justifies the use of strychnine in the treatment of acute or chronic heart failure.

It is not our intention to deny with equal positiveness the correctness of his conclusions, but it is our intention to criticize and condemn sweeping and absolute statements of this character, which controvert general professional opinion, which represent the views of only one man, and which are based upon the study of only eight cases, particularly when most, if not all, of these cases were in a condition in which it is questionable whether any drug could produce definite favorable results at the time it was used. For example, the first case was a male, aged twenty-seven years,

suffering from aortic regurgitation, mitral regurgitation, broken compensation, dyspnea, right hydrothorax, ascites, and edema of the legs. He received one-thirtieth of a grain of strychnine three times a day for three days with no subjective improvement, no change in the blood-pressure, and no increase in diuresis. The strychnine was discontinued and diuretin and digipuratum given. The patient made no improvement and died twenty days after entering the hospital. This does not prove that strychnine is not capable of aiding a patient who has ruptured compensation; it rather proves that in certain cases of ruptured compensation rest in bed and all drugs fail because the patient must die.

In another case, a male of fifty years, weighing 230 pounds, with hydrothorax, ascites, edema, and a rapid, feeble pulse, suffering from dyspnea, Cheyne-Stokes respiration, and a systolic blood-pressure of 110, was given one-tenth of a grain of strychnine twice a day at 9 A.M. and 5 P.M. Apparently only two doses were given, without good results. Camphor was then administered, and improvement followed; he was then given digipuratum and diuretin. Ultimately the patient recovered. As the strychnine was only given for one day, and was administered hypodermically to a patient who was suffering from general edema, the chances are that it was not absorbed from the subcutaneous tissues, or, if it was absorbed, it may have been responsible for the improvement the next day when camphor was given subcutaneously. To give any drug hypodermically in the presence of general edema is equivalent to injecting a dose of medicine into a wet sponge.

In another patient, aged thirty-six years, with very severe break in compensation, general anasarca, right hydrothorax, ascites, one-tenth of a grain of strychnine was given three times at three-hour intervals. As the patient did not improve it was stopped. Although strophanthin was given intravenously, camphor was administered subcutaneously, and she was given digipuratum and caffeine, the author states that none of these procedures caused any significant change in the patient's condition, and she died. The correct conclusion to arrive at from this case, according to the author's argument, therefore, would be not only that strychnine, but camphor, digipuratum and caffeine are of no value in ruptured compensation.

In another patient, aged fifty-three years, there was general arteriosclerosis, auricular fibrillation, myocardial degeneration, broken cardiac compensation, general edema, hydrothorax, and ascites. This patient received strychnine, in quantity not stated, for six days, at which time she was also having digitalis "to the point of toxicity." This is a case in which strychnine was apparently expected to "raise the dead." A somewhat similar criticism might be applied to case eight.

It is a fair statement that physicians in general do not use strychnine as a remedy in ruptured cardiac compensation; they employ it rather for the purpose of combating evidences of sudden circulatory failure, and improvement often occurs. Whether this results from stimulation of the heart or of the vasomotor center, or whether it results from stimulation of the nervous system, which in turn acts favorably upon the circulatory apparatus, is probably as yet undecided.

We welcome heartily every investigation which is made as to the value of commonly employed remedies. We are convinced that there is far too little research along these lines; that many of the remedies daily employed by physicians are given of necessity in the majority of instances on a purely empirical basis; but a warning ought to be issued against sweeping statements based upon a very few cases presenting conditions which prevented a drug given hypodermically from being absorbed, and accompanied by little or no information as to whether there were albumin and casts in the urine. A man might just as well conclude that there was adequate evidence that there is no God after having conversed with eight atheists as to conclude that strychnine is of no value after having

used it in eight hopeless cases, particularly when millions of people believe that there is a beneficent God and thousands of physicians believe that strychnine aids them in saving life in the face of undoubted sudden cardiac failure.

GASTRIC HEADACHES.

There can be no doubt that headache is the most common form of pain suffered by human beings. It is, of course, only a symptom and not a disease in itself. It arises from autointoxication which may be, or may not be, due to constipation, from eye-strain, from the excessive use of tobacco, in women with pelvic disorders, and it is a symptom which is fairly constant in some stage of nearly every infectious disease. In many instances the patient believes it to be due to gastric disorder, but in all probability most of these patients consider that it is gastric in origin because there is some nausea associated with the pain, and they believe this represents sick stomach; whereas, as a matter of fact, in most of these cases the trouble probably lies in a disordered function of the liver and possibly of the pancreas.

Cheney expresses the belief, in the *American Journal of the Medical Sciences* for May, 1915, that a fair proportion of cases are truly gastric. He admits that it is difficult to understand how disorder of the stomach can cause violent pain in the head, and that no adequate scientific explanation for it can really be given. He thinks that it is equally difficult to explain how constipation causes headache and why the pain disappears promptly after the lower bowel is emptied.

We agree with him in thinking that the gastric type of headache is difficult of explanation, but in that type due to constipation we are inclined to think that the use of a purge relieves the headache quite as much by changing the condition of the stomach and small intestine as it does by evacuating the large bowel, and that in this type of case the headache is often due to an autointoxication or to some disturbance of the circulation which we do not understand. He points out that gastric headaches are of variable duration and rarely last for twenty-four hours, and seems to think that they are characterized by being present in the morning and growing more intense as the day goes on, although he recognizes that there may be an evening onset and a morning relief. We are not inclined to agree with him in thinking that in these cases in which there is nausea and vomiting the trouble is alone gastric, but it is certainly true that in the majority of cases no disturbance of health is left after the attack.

One of the most remarkable things in connection with headaches arising from disorder of the alimentary tract is not only their severity, but the fact that persons who have organic disease, such as ulcer or carcinoma of the digestive tube, rarely suffer from headache even when the pathological lesion seriously disturbs function, as for example carcinoma of the pylorus causing the prolonged retention of food in the stomach. There is no definite localization of the pain in so-called gastric headache which enables us to determine the underlying causes, but in many instances there is belching of gas or the bringing up of sour food in the mouth. In some instances an analysis of the gastric contents reveals hyperchlorhydria, and this is particularly apt to be present in patients who find they have developed headache on taking acid foods or drinks. In other instances there is a low-grade gastric catarrh with hypochlorhydria. In some instances Cheney believes the primary condition is constipation, which induces gastric trouble, this in turn inducing headache, or it simply exists as a collateral symptom.

Undoubtedly the author of this article is correct when he states that no class of sufferer, from any sort of disease, is more grateful than the victim of chronic headache who finds himself at last freed from this annoying and incapacitating disturbance.

OCULAR TRAUMATA.

Under this heading are properly classed injuries so frequently encountered and for which immediate treatment is so often required that a general knowledge of their nature, characteristic features, and the proper method of handling them should constitute a part of every well-informed doctor's education. Unfortunately it does not, and it is undoubtedly true that because of ignorance of this matter cures which might have been obtained are either imperfect or the sight is permanently and completely lost. It is quite true in regard to the eye that even a trifling injury may terminate disastrously, and that the most favorable time for skilful intervention is as soon after the accident as possible. Eales (*Birmingham Medical Review,* February, 1915) considers first the superficial injuries, beginning with a foreign body. Rubbing the eye destroys Nature's curative attempt and drives the foreign particle in the recesses of the upper fornix, where it must be sought by eversion of the upper lid, or—if the fragment have sharp edges—it may become embedded in the cornea and require removal by the spud. The advent of sepsis incident to injudicious removal of corneal tissue may produce a permanent scar with lasting detriment to vision.

Usually whether the body be removed at once or after a few days, when it is surrounded by a whitish ring of softened epithelium, and is readily removed together with a small slough, repair follows without scar.

The author advises the local sacrifice of the conjunctiva if the particle be firmly embedded in that membrane, and particularly cautions against the use of acetate of lead when there is a breach of the corneal epithelium, lest the whitish deposit of lead albuminate permanently impair the sight of the eye.

As to burns, cold applications are useful and weak antiseptic lotions should be freely used, whilst an oily solution of cocaine is most acceptable for the relief of pain.

Intraocular complications should be early combated by the use of atropine, the patient being confined to bed in a darkened room. Hot fomentations in the stage of reaction will assist the separation of the necrotic tissue.

As for fresh lime, every fragment of the alkaline mass must be removed at the earliest possible moment, since it acts as a powerful and lasting caustic.

Serpiginous ulcer often follows a supposedly trivial accident, the occurrence of such an ulcer being associated with the presence of the pneumococcus. The source of the irritation is often traceable to the lacrimal sac. Pneumococci await only the advent of a breach in the corneal epithelium through which to press home their attack. There is a crescentic ulcer whose floor is only a shallow depression, but whose edges are opaque, raised, undermined, suppurating. While progressing in one direction it tends to cicatrize in the other, creeping onward over the corneal surface, as its name suggests. In rare instances it may entirely destroy the cornea in a few days. It is accompanied by iritis and hypopyon with great pain and intolerance to light. Even perforation may be indicative of a hopeful turning point, the ulcer healing before destruction of the cornea be completed. At the best, however, the prognosis is always serious, for a dense leucoma must inevitably result. Moreover, there may be subsequently developed sympathetic ophthalmitis in the fellow eye. There is yet to be found a corneal injury so trivial that its treatment can with safety be ignored, or even postponed, or such as to justify the utterance of an unqualified cheerful prognosis gleaned from the findings of a single observation.

In the treatment of serpiginous ulcer the eye should be kept at rest both to relieve pain and to protect it from further injury. A darkened room, rest in bed, and a firm bandage will assist the cure. The accompanying iritis will demand the instillation of atropine, which will both diminish vas-

cular congestion and induce the physiological rest which results from complete cycloplegia. The more rapidly this is achieved the more hopeful the prognosis. Leeches are indicated for the relief of pain, and are often followed by satisfactory dilatation of a pupil previously rendered sluggish to the effects of atropine by virtue of intense congestion of the iris. Moist heat, in the form of a hot fomentation, will relieve pain by diminishing congestion and reducing intraocular tension, while the salts of silver are useful antiseptics. In addition to local remedies general constitutional drugs should not be ignored. A calomel purge followed by a saline draught or full doses of quinine may be ordered with advantage. Where pain is so continuous as to deprive the patient of rest a hypodermic injection of morphine may be called for.

If improvement is not manifest after forty-eight hours the cautery should be applied without further delay. Since this is the result of infection all corneal traumata should be treated with due regard to cleanliness. Where the lacrimal sac is clearly the source of infection it should be excised, while its fellow also may call for extirpation as a valuable prophylactic procedure.

The eye is intolerant of sudden severe shock. A light blow may cause nothing more than abrasion of the cornea with congestion of the iris, contraction of the pupil, and dimness of vision, spontaneous recovery resulting in a few days, but during this period the patient should be confined in bed with atropine, cold compresses, and judicious purging. In cases of great severity the pearly-gray appearance between the nerve head and the macula due to edema of the retina may establish the diagnosis of commotio retinæ, a condition which tends to clear up with full restoration of vision in the course of three or four days. Hemorrhage if subconjunctival is usually more alarming than hurtful. If, however, it occurs several days after injury this is a sure index of fracture of the anterior fossa of the skull. Intraocular hemorrhage of the vitreous chamber is especially serious, nor can the full extent of the damage be immediately determined. A fairly common result of contusion is irido-dialysis, the force of impact determining separation of the iris at its periphery. The diagnosis is easily made by the aid of transmitted light. The red choroidal glare is visible not only through the pupil but also through the rent in the iris, while the pupilary opening is flattened in the diameter of the rupture. Extensive bleeding may obscure the diagnosis.

Choroidal hemorrhage, always serious, may produce extensive detachment of the retina. This is always a serious matter, though perhaps not so grave when due to injury of a healthy globe as when caused by ocular disease. If detachment be complete return of vision cannot be looked for. The indicated treatment is rest in bed with a double-pressure bandage and injection of 5 to 10 minims of 1:2000 solution of bicyanide of mercury in normal sterile saline. It is rendered painless by the addition of a one-per-cent solution of acoine. This procedure should be repeated in from four to six days when the resultant conjunctivitis is waning, and should be kept up for four or five weeks. Diaphoresis should be induced by subcutaneous injection of ⅛ to ¼ grain of pilocarpine, whilst scleral puncture over the site of the detachment is feasible. Improvement should be noted in three weeks.

Traumatic subluxation of the lens is fairly common. A dislocated lens frequently, but not always, becomes cataractous. This process is often rendered rapid from the presence of a tear in the capsule. The treatment is mainly operative. A painful eye the seat of recurrent inflammatory attacks subsequent to lenticular dislocation may have to be excised.

Where the sclerotic is extensively ruptured the globe should be without delay sacrificed in the interest of its fellow. As to wounds, all penetrating wounds result in diminution of the intraocular tension. Traumatic opacity of the lens would appear to complicate nearly 49 per cent of the perforating injuries of the globe. It will cer-

tainly accompany any injury which by interfering with the lens capsule offers the aqueous ingress to that organ. Thus any foreign body which has perforated the cornea and ruptured the lens capsule will result in traumatic cataract, and not infrequently the foreign particle is retained within the lens and readily removed together with it. The diagnosis is not always evident. Immediately after the accident the shallowness of the anterior chamber and the diminution of intraocular tension will assist the diagnosis of perforation, but often the injury is not immediately regarded as serious, and after the lapse of a few hours the corneal wound will have closed up and the newly-secreted aqueous have restored the anterior chamber to its proper depth, and the tension of the globe to its natural tone. At this time a pin-point perforation of the cornea may only be found after diligent search under full mydriasis. An examination under full mydriasis will be required to determine the existence of a small rent in the lens capsule. Often the patient only seeks advice days or weeks after the accident, when considerable opacity of the lens has resulted in almost complete loss of vision.

Simple perforating wounds of the cornea may heal rapidly by first intention, but if there be a prolapse of the iris this should be reduced, provided the adhesions are recent and soft. If more than forty-eight hours have elapsed since the accident the iris will have been firmly sealed to the inflammatory wound by the exudate, but the adhesions may be carefully broken down, and the prolapsed iris excised. Later this cannot be done, since the exudate contracts and forms a firm ring of constriction, while the prolapse is covered by new-formed tissue and irrevocably incarcerated in the contracting cicatrix.

Perforating wounds are rendered still more alarming if the foreign body be retained within the globe. Foreign body is usually rapidly concealed by hemorrhage or increasing traumatic opacity of the lens, or is encapsulated in inflammatory exudate. If the foreign body can be localized and is accessible near the scleral wound it should be sought by the introduction of Snell's magnet, especially if the lens chance to have escaped injury. In other cases more powerful magnets are employed, since the foreign body tends to follow the path of least resistance, and enter the anterior chamber by perforating the suspensory ligament. In coming forward the foreign body is often entangled in the iris, and if a corneal wound is present further efforts with the giant magnet will probably determine considerable prolapse. For this reason it would seem better to discard the more powerful instrument and complete the delivery by introducing the point of Snell's magnet into the anterior chamber, and even then a small iridectomy may be required.

Should the foreign body fall into the anterior chamber and remain clear of the iris it is easily dragged through the corneal wound by the giant magnet. The earlier the foreign body is extracted the more hopeful the prognosis. If seen for the first time some weeks after the accident, even a metallic foreign body may fail to be removed by the magnet because it has become encapsulated in the tissues.

SOME INFECTIONS OF THE TONSILS.

Pybus (*Lancet*, May 22, 1915), in writing an ingenious paper detailing the enthusiasm with which medical inspectors throughout the United States have taken to the task of clearing the children of our public school system of the annoyance and even of the danger of tonsillar hypertrophy, points strongly to the fact that there is in this procedure a danger and a very distinct one. Aside from those peritonsillar affections called quinsy, which in themselves are at times fatal, and a post-tonsillar secondary lymphangitis which may suppurate, there are a number of infections which find their point of entry through the tonsils and which at times produce disastrous results. As to streptococcus infection, it is a constant one about the mouth and throat and is the usual source of acute infection, causing catarrhal

inflammation, lacunar tonsillitis and peritonsillar inflammation, and suppuration. It not infrequently causes cervical bubo and suppuration, and may cause septicemia or endocarditis after its entry into the blood.

Perhaps one of the most important streptococcic infections is that modified variety which is associated with the production of rheumatism. Tonsillitis so often precedes an attack of acute rheumatism that the tonsil is necessarily suspected of being one of the chief gates for the organism. Poynton and Paine have shown that this tonsillar infection may later manifest itself in almost any tissue or organ of the body. Through work subsequently corroborated by Beattie, Dixon, Walker, and others, Poynton and Paine have shown that the organism found in acute rheumatism, although appearing in the lesion as a diplococcus, on cultural examination grows in chains and belongs to the streptococcus group. The evidence that this organism is the chief causative agent in the production of acute rheumatism is accumulating, and its acceptance amongst the profession is increasing.

Rheumatism is often preceded by an attack of tonsillitis, as are recurrences. Streptococcus of the rheumatic type has been found in the tonsil, and in most cases of rheumatism lesions can be found there. The original case of Poynton and Paine was that of a patient with chronic endocarditis. Following an attack of tonsillitis organisms were isolated from the tonsil showing the usual characteristics of the organism they describe. On inoculation into a rabbit endocarditis was produced. Beattie and Yates examined material from various lesions in the throat, joints, and blood. The organism in a large percentage of cases produced the typical joint lesions in rabbits. It is also of interest to note that a positive result has been obtained from the organism found in the cerebrospinal fluid in cases of chorea, and the diplococcus rheumaticus has been isolated from the pia mater and endocardium. They call the condition "cerebral rheumatism." French and Hicks in an analysis of 29 cases found that 19 had suffered previously from chorea. In three fatal cases which were associated previously with fever endocarditis was found post mortem. Buist is quoted to the effect that out of 266 cases of chorea during pregnancy 66 had previously suffered from chorea during childhood. Branson notes that in a series of 75 children suffering from Sydenham's chorea, 21 per cent had been operated on for enlarged tonsils and glands. Nasopharyngeal lesions were present in 88 per cent of these children with chorea, and 62 per cent had enlarged tonsils or had been operated on for them. Showing the evidence of infection from their tonsils all these cases had enlargement of the corresponding lymphatic nodes. Removal of the tonsils has been done with considerable success in the treatment of chorea. Of course this would not materially affect a disease due to nasopharyngeal infection. One case indeed was unaffected by the removal of the tonsil until a chronic suppurating ear was cured. The evidence is well-nigh convincing as to the dependence of chronic arthritis upon infection, and particularly upon that which gains entrance at the fore end of the alimentary canal. Relapses are attributed to reactivity of organisms lying latent in the synovial membrane, which they are able to do for weeks, months, or years. There can be no doubt indeed that a certain number of cases of rheumatoid arthritis are due to infection from oral sepsis, and infected tonsils form an important part of this lesion.

Occasionally they may pass into the appendicular artery and infect the appendix vermiformis. The frequency of streptococcal infection has been abundantly demonstrated. Appendicitis may be produced experimentally by inoculating the blood with various organisms. Acute tonsillitis and appendicitis may occur at the same time. Poynton and Paine mention a case of associated appendicitis, tonsillitis, and rheumatism. In both cases microörganisms from the throat produced arthritis, while those from the appendix when inoculated into six rabbits produced one case of appen-

dicitis. In another series of experiments with the diplococcus obtained from a rheumatic joint, out of eight animals inoculated arthritis was produced in all, while appendicitis was produced in two. The clinical evidence largely points to the tonsils being one, if not the chief, seat of entry for the rheumatic organism. The signs may be those of acute tonsillitis, or the process may be a chronic one with an entire absence of fever or signs of active mischief in the tonsil itself.

The pneumococcus can frequently be found in the tonsils of apparently healthy persons, or it may lead to what is called acute tonsillitis and abscess. Systemic invasion occasionally occurs from the staphylococci and leads to blood invasion of either the septicemic or empyemic type. It is well known that the diphtheria bacillus may be a harmless inhabitant of the tonsil either in the true or the pseudo type. Once lodged in the recesses of the lacunæ it is often most difficult to get rid of and may cause repeated attacks of the disease. These patients carry about a disease dangerous to themselves and to others, and the most effective way of curing the carrier is to enucleate the tonsils.

The bacilli of influenza have been repeatedly demonstrated in the tonsils. It has also been shown that poliomyelitis may gain access through the tonsil. The relation of scarlet fever is one of great importance. The attack is so often ushered in by tonsillitis that some causal relation between the two must be considered as established.

As to hypertrophy of the tonsil, 6 to 8 per cent of children suffer from this condition to such a degree as to necessitate operation. In London of 200,000 children examined 10 per cent had hypertrophied tonsils. Pathologic hypertrophy usually corresponds with the decay of the milk teeth and some time after the development of the secondary ones. The main factor in causing hypertrophy is infection. Moreover, the enlargement of the pharyngeal tonsil with the consequent establishment of mouth-breathing is a factor in tonsillar hypertrophy. Indeed tonsillar hypertrophy has a very definite relation with dental caries.

The principles to be adopted in the treatment of tonsillar disease may be summed up as follows: So far as the individual is concerned, where the symptoms are mainly or entirely mechanical, and fail to subside in three months after removal of any source of infection, partial removal may suffice. Tonsillotomy, however, has this disadvantage—the basal portion of the tonsil may enlarge and again cause symptoms. In addition to this many hypertrophied tonsils, so far as can be ascertained on inspection, do not appear to be grossly infected. In those cases which are grossly infected the basal portion, often the most diseased, is left behind and may commence to give trouble, especially if some of the lacunæ become partially or entirely sealed up in the process of healing.

When infective symptoms predominate in the tonsil itself, such as acute tonsillitis or chronic lacunar infection, or when the tonsils are in addition enlarged, any source of infection must be removed, especially carious teeth. Nasal breathing must be reestablished, and the case watched to see the effect of the treatment. Where the tonsil is too severely affected to be capable of recovery, as judged by the recurrence of symptoms and the failure of the above measures, then total removal is indicated. Enucleation of the tonsil must necessarily prevent tonsillitis, and while it does not entirely prevent pharyngitis such attacks are usually materially lessened in frequency. When repeated quinsies have occurred further attacks may be prevented by removing the source of the infection, the tonsil.

For lymphatic gland infections, where tuberculosis is suspected tonsillectomy is indicated; the course of the glandular enlargement determines whether this also may require operation. In pyogenic infections of the glands the tonsil must be dealt with when the acute lymphadenitis has subsided or been operated on if suppuration has supervened. Chronic glandular enlargement of the mild or moderate degree is so frequently met with in hypertrophied ton-

sils that when the tonsil recovers its normal character the glands subside also. It should be a rule that no tonsil should be removed when actually inflamed. For more distant infections, when the tonsil is suspected of being the focus, removal is indicated when the general condition is satisfactory.

In all these cases total removal is the operation of choice. It presents no greater danger than incomplete removal and can be readily accomplished by the guillotine alone, by a method first described by Whillis and Pybus.

While these methods directed to the individual are of great importance there is no doubt that prevention of tonsil infection should be the chief aim. This is to be obtained by the advance of hygiene, in the home and school. The maintenance of nasal respiration, the prevention of dental caries, and the proper supply of food in sufficient quality and quantity will greatly diminish the prevalence of this condition. The provision of a cleaner air supply and the prevention of infection by milk are measures needing attention. When that delicate balance between health and infection is upset and the tonsil, a useful organ, becomes diseased and incapable of recovery, a timely removal of this focus may prevent more grave illness and disability. The question of infection of the tonsil and from the tonsil is not to be summed up in some form of operative procedure, but by attention to the numerous measures indicated.

REPORTS ON THERAPEUTIC PROGRESS.

THE CLINICAL USE OF DIGITALIS.

HIRSCHFELDER in the *Saint Paul Medical Journal* for April, 1915, in discussing this subject says that one of the commonest forms of altered rhythm that one encounters is that in which a perfectly regular rhythm is interrupted at intervals by a pair or a trio of short, quick beats with loud, sharp heart sounds which are followed by a prolonged pause, until the normal rate is resumed. This is extrasystolic arrhythmia. The second beat of the pair or the third beat of the trio is the extrasystole, produced by a new contraction which usually arises at some abnormal site. It is due to an increased irritability of the heart muscle, although if the excitability of nerve and muscle is increased by some chemical or toxic agent, irritation of the cardiac nerves, especially the accelerators, may be the exciting factor. Such extrasystoles or abnormal beats usually arise in an overexcitable or overfilled ventricle. A ventricular extrasystole is the easiest of all the irregularities to recognize, because it is usually accompanied by a big flapping single pulsation which sweeps up along the external jugular vein across the sternocleidomastoid—often up to the angle of the jaw. On auscultation, a single loud sound may be heard with these extra beats in contrast to the lower double ones accompanying the normal ones. On the other hand, if the extrasystole arises in the auricle, as it often does, especially in mitral stenosis, all the beats are accompanied by double pulsations and by double sounds over the jugular.

Now these isolated pairs of extrasystoles —one pair a minute, two pairs a minute, two or four pairs a minute—may appear in otherwise healthy individuals perhaps with a little chronic constipation and gastrointestinal fermentation as an exciting cause, and they need no treatment at all; but they may also appear in persons with weak heart or high blood-pressure, and under certain circumstances the occurrence of extrasystoles may contribute one of the main indications for digitalis. In the writer's experience the differentiation between the two conditions may be made easily. When extrasystoles indicate a real weakness of the heart, they become more frequent after mild exercise, such as waving the arms to and fro. When they are of secondary importance, they become less

frequent or even disappear upon exercise. When exercise causes the extrasystoles to become more frequent, the patient needs digitalis to make his ventricles pump more strongly and to overcome the resistance better. When the extrasystoles become less frequent during exercise, they may be disregarded in prognosis and he does not need digitalis.

Extrasystoles, unless they occur many times per minute, do not themselves impair the circulation, but merely give expression to the general weakness or irritability of the heart. We shall see in a moment that this is in striking contrast to auricular fibrillation.

By far the most interesting form of arrhythmia, especially from the standpoint of digitalis administration, is the absolute arrhythmia, irregularity in force and rhythm in which all trace of regularity is completely upset by an entire irregularity in the sequence of short beats and long beats. This irregularity is most common in old cases of mitral stenosis and in old cases of myocarditis, but it may also spring up suddenly, last for minutes, hours, or weeks, and then subside suddenly, even in hearts that are otherwise normal. It can easily be diagnosed by the card method or by the auscultatory method, because in contrast to the sinus or respiratory arrhythmia each beat is accompanied by a single and not by a double wave in the jugular, and by a single and not a double jugular sound, and no regularity or sequence can be made out in the rhythm. Now the effect of this arrhythmia is so great that its occurrence does in itself, independent of any actual weakness of the heart, materially impair the efficiency of the circulation. Therefore the occurrence of this arrhythmia in itself demands treatment, and fortunately it responds the best of all to the administration of digitalis. The reason for this is to be found in the causation and propagation of the impulses.

The extrasystolic arrhythmia is produced by an increased irritabilty of the heart muscle. The auricular fibrillation is produced by a still higher grade of irritability, so great that each fiber contracts without waiting for its neighbor. The fibers do not keep step, but each fiber in its independent contraction sends down a stimulus to the ventricle. Some of these impulses, of which there are between three hundred and a thousand per minute, are strong enough to cross the His bundle and to cause it to contract. Others are too weak to do so, and never reach the ventricle. Whenever an impulse does reach the ventricle it contracts, but as these fibrillary impulses are irregular in intensity as well as rate, they set up an irregularity in both force and rhythm. Now the great harm that this condition does is by sending so many impulses to the ventricle that it leaves no time for rest or for regeneration of contractile substance, and the heart wears itself out. If we can prevent some of the impulses from crossing the bundle and reaching the ventricles, we can give the ventricles time to rest and to exert forcible contractions instead of weak ones. This is just what the administration of digitalis does. The effect of therapeutic doses of digitalis is not enough to block normal impulses, but it is enough to block the impulses produced by the fibrillating auricle; and by raising or lowering the dose of the drug, we can block as many of these impulses as we desire.

PUERPERAL ECLAMPSIA.

The *Lancet* of February 13, 1915, contains an article by PURSLOW in which he gives this advice as to prophylactic treatment. He believes that there can be no doubt that in many cases in which the disease is threatened it can be warded off by appropriate means, and success depends on an early recognition of symptoms of the preëclamptic state; these are numerous, but the writer would say that the most constant and important are albuminuria, persistent headache, and edema. Other symptoms may be disturbances of vision and hearing, and vomiting. One prodromal symptom which is not common, but which when it occurs is, in the writer's opinion, of most unfavorable prognostic

import, is severe epigastric pain. The albuminuria associated with eclampsia, in which there is usually a large amount of albumin present, is practically confined to the latter half of pregnancy, cases of eclampsia before them being rare. Pronounced albuminuria in the latter months is a dangerous complication for both mother and child, and the danger of the condition is greatly increased by the fact that it is so often unrecognized and untreated until the sudden onset of a convulsion calls attention to the case.

It should be made a rule to examine the urine of every pregnant woman in the latter half of pregnancy, and the examination should be repeated at intervals, shorter as full term approaches; if this rule were adhered to the death-rate from eclampsia would be greatly reduced. It should always be borne in mind that a haze of albumin may be due to mixture with vaginal discharge, so that if albumin is present in the specimen passed by a patient one should never base a diagnosis or treatment on that, but should examine a catheter specimen. If, on the other hand, there is no albumin in the specimen voided by the patient it will not be necessary to pass a catheter. If albumin is present a microscopical examination and an estimation of urea are advisable. Statistics show that this disease is more likely to occur in primiparæ, and in the writer's experience it has seemed that its occurrence is more to be feared in well-developed women who have been in the habit of taking a large amount of exercise and eating much solid food.

When albumin is found in considerable quantity in the urine of women in the later months the case should be taken in hand at once. In the first place the patient should be confined strictly to bed, and it is a very good plan to commence the treatment by giving nothing whatever but water for the first forty-eight hours. Afterwards milk, well diluted, may be given, and the diet should be limited to that until there is distinct improvement in the secretory function of the kidneys. Free purgation is essential, and for this purpose 30 grains of pulv. jalapæ may be given, or sodii sulphas 1 drachm, in 2 ounces of water, every two hours, until free purgation is produced. Rectal injections of normal saline may be given after the bowels have been well emptied, or saline may be given *sub cute*. If in spite of this treatment the renal secretion does not improve, or if prodromata of eclampsia come on, the difficult question of induction of premature labor presents itself. On the whole, the writer is inclined to advise that labor should not be induced. He has seen some most satisfactory cases in which the treatment already set out has been followed by spontaneous delivery without the occurrence of eclampsia, even when the patient has seemed to be on the verge of an attack.

The practitioner is generally sent for as soon as a fit has occurred, and in some cases it will happen that there will have been no prophylactic treatment because the patient had not been under medical care, and neither she nor her friends will have suspected that anything was wrong until they are alarmed by the occurrence of a fit. The patient should be at once put to bed in a darkened room and preserved from all external causes of irritation as far as possible. An efficient nurse should be obtained, and she should be instructed that if another fit comes on the patient should be watched carefully to see that no harm befall, as by suffocating in the bedclothes or falling out of bed. During the fit a piece of wood should be placed between the teeth to prevent the tongue being badly bitten. It is a good plan to place one side of the bed against the wall, as the nurse can then more easily control the patient. During the coma which follows a fit the head should be brought to the edge of the bed and turned well over on one side so as to allow the saliva to escape and prevent its entering the trachea.

If the patient is able to swallow she may be given water, but no food, not even milk, should be given. A quickly acting aperient may be given, and one of the best is croton oil 2 minims, made up with powdered sugar and placed on the tongue; in addition

a copious enema of soap and water may be given, and when this has acted a further rectal injection may be slowly given of 4 ounces of water containing 2 ounces of sulphate of magnesia. If the apparatus is at hand it is also well to wash out the stomach. Poultices to the loins probably encourage action of the kidneys, and at all events can do no harm. The writer is not in favor of hot-air baths. One of the few methods, in addition to purgation, upon which almost all writers are agreed is the administration of subcutaneous or intravenous injections of saline—chloride of sodium 1 drachm to the pint.

Before proceeding to discuss the obstetrical aspect of the question the writer refers briefly to some of the numerous other methods which have been advocated for dealing with the fits and toxemia.

Chloroform: If any operative interference is contemplated, even such a small procedure as puncture of the membranes, chloroform should be given, but the writer is entirely opposed to the method so frequently adopted of attempting to control the convulsions by its continuous or intermittent administration.

Morphine: This treatment has been extensively advocated of late years; it is given by hypodermic injection in an initial dose of ½ grain and subsequent doses of ¼ grain until a total amount of 2 grains has been reached. The writer has tried it, but has not been convinced of its advantages, and has not used it lately; and he would say the same of venesection.

Thyroid extract in doses of 30 to 40 grains has been suggested by Nicholson, of Edinburgh, who reports good results from its use.

Nitroglycerin in subcutaneous injection up to 5 minims has been tried with successful results.

Veratrum viride has been extensively used in America, and recently Haultain, of Edinburgh, has brought forward several successful results from the hypodermic injection of veratrone. This remedy is particularly indicated in cases of high pulse tension.

Pilocarpine has been extensively used, but on account of its tendency to increase bronchial secretion it is, in the writer's opinion, a dangerous drug.

Oxygen inhalation in cases in which cyanosis is a marked symptom would be highly desirable.

Cold baths are said to be useful in cases in which hyperpyrexia is a marked symptom; this is a not infrequent complication of eclampsia, and is one of bad prognostic import.

Decapsulation of the kidneys and lumbar puncture have both been advocated and practiced, but only to a limited extent, and apparently without any striking success.

There have been many differences of opinion revealed in the methods of treatment we have already been considering, but when the writer enters on the consideration of the obstetrical treatment he might describe the authorities as being divided into two hostile camps, their actions depending in a large degree on the views they hold as to the causation of eclampsia. The one, which the writer may call the Rotunda school, believes that the toxin is elaborated from the food taken in by the mother owing to some faults in her metabolism. The other, or what the writer may call the German school, considers it to be due to the fetus, and has advanced the theory recently that the symptoms are due to placental albumin finding its way back to the maternal blood-stream in quantities greater than can be dealt with at the time by the antibodies which are elaborated to deal with it. It is on the presence of these antibodies in the maternal blood that Abderhalden's serum test for the diagnosis of pregnancy is based. Those holding the first view advise little or no interference with the process of labor; while to those holding the second no methods are too radical—induction of labor, accouchement forcé, vaginal and abdominal Cæsarian section being each advised in particular cases.

Personally, if labor has started and can be terminated quickly under an anesthetic by forceps the writer would not hesitate to interfere, but the difficult cases are those

in which severe eclampsia is in progress, fit succeeding fit, with no lucid interval, and in which there is no sign of labor, the os remaining closed and the cervix not taken up.

Puncture of the membranes can be done with little disturbance of the patient and is a harmless proceeding; it rapidly diminishes intrauterine tension, but as a means of inducing labor it is very uncertain in the time it takes; if done, every antiseptic precaution should be taken.

As regards the other methods, the writer would say emphatically of the slow ones (under which he includes bougies, tents, packing of the cervix and vagina, and rubber dilating bags, including that of Champetier de Ribes) that they are contraindicated in the treatment of eclampsia, and if there is one thing about which he is convinced on this question it is that interference, if decided upon, should be by rapid methods under anesthesia, and he would select dilatation by Bossi's dilator or vaginal or abdominal Cæsarian section. He thinks that, on the whole, for this class of case the form of active treatment likely to be least prejudicial would be abdominal Cæsarian section, but he feels convinced that if a good trial be given to the milder methods it will be found that the results will be better than those obtained by the most heroic operative procedures.

BENZOL THERAPY IN LEUKEMIA AND LYMPHOSARCOMA.

MOORHEAD in the *British Medical Journal* of March 6, 1915, tells us that during the last year he has had an opportunity of testing the reputed action of benzol as a useful therapeutic agent in leukemia. He has now treated altogether four cases with this drug—one of myelogenous leukemia, one of lymphatic leukemia, one of lymphosarcoma, and one of what was regarded as osteosarcoma.

The introduction of the drug and its mode of action have been very fully discussed in recent papers, many of which contain a full bibliography up to the date of publication. In consequence the writer only proposes to refer to those facts which it is essential to bear in mind in order that the reasons for employing the drug at all may be understood, and he will omit practically all reference to the literature of the subject.

In 1910 Selling reported in the *Johns Hopkins Hospital Bulletin* three cases of purpura hemorrhagica that had occurred amongst workers in a factory where benzol was largely used. Careful investigation of these showed that the clinical symptoms of benzol poisoning consisted of giddiness, headache, vomiting and diarrhea, and purpuric eruptions. The blood picture showed a striking diminution in the number of the white cells, the polymorphonuclear cells being diminished out of proportion to the lymphocytes, and moderate red-cell anemia. Two of the cases proved fatal, and the most significant pathological lesion found was a striking diminution in the number of white cells in the bone-marrow. Experimental work, consisting of the subcutaneous injection of benzol into rabbits, showed that moderate doses produced in these animals a leucopenia and changes in the marrow similar to that described in the patients referred to, but did not injuriously affect the red cells. If the drug was pushed, ultimately red-cell anemia was produced.

Reasoning on the above stated facts, von Koranyi concluded that moderate doses of benzol might prove of use in cases of leukemia. He put the matter to the test, and in June, 1912, was able to report a case of splenomedullary leukemia in which as a result of benzol therapy the white cells had been reduced within three months from 173,000 per c.mm. to 8000 per c.mm. with concomitant general improvement.

The conclusions derivable from von Koranyi's cases and those of others may be summarized as follows:

1. Benzol first tends to increase the number of white blood cells, but shortly leads to an improvement of the leukemic condition. The decrease in white cells is at first slow and later more rapid, and may proceed in an irregular manner. Once the

decline of white cells has started, it tends to continue for some time, even if the benzol is stopped.

2. As the white cells diminish in number, the differential count both in splenomedullary and lymphatic leukemia approaches more nearly to the normal, but as a rule some myelocytes persist in the splenomedullary disease, and in the lymphatic form the lymphocytes continue to be excessive in proportion to the other white cells. In short, even when the total number of white cells is reduced to normal, the differential count shows the presence of some leukemic characteristics.

3. The average dose of benzol that may be administered with safety is from 3 to 5 grammes daily. It is best given in gelatin capsules, combined with an equal quantity of olive oil, which seems to lessen the tendency of the benzol to produce heartburn and gastric irritation.

4. The effect of benzol on the spleen in splenomedullary leukemia is variable. In some cases the spleen diminished almost to normal; in others, even when the blood picture is reduced to normal, the spleen remains large.

5. The ultimate result in apparently cured cases of leukemia is still to be waited for. There is as yet no proof that the cure produced is of a permanent nature. One case of von Koranyi's was reported as quite well ten months after the cessation of the treatment.

FURTHER OBSERVATIONS ON THE TREATMENT OF SCIATICA BY PERINEURAL INFILTRATION WITH PHYSIOLOGICAL SALINE SOLUTION.

LESZYNSKY in the *Medical Record* of February 6, 1915, recommends this method of treatment and describes the technique as follows:

During the application of the treatment the patient should lie on the abdomen with the legs fully extended, and the feet projecting beyond the edge of the table. A firm pillow is rolled and placed under the lower part of the abdomen in order to favor relaxation of the gluteal muscles. For the purpose of locating the nerve the following measurements are made: A line is drawn from the sacrococcygeal articulation to the posteroexternal border of the great trochanter; at the junction of the inner one-third and the outer two-thirds of this line is found the spine of the ischium. One inch to the outer side of this point is located the point of puncture. An area of the skin about 4 cm. in diameter is then painted with iodine, the point of puncture being in the center. The syringe used is all metal, holding 60 Cc. (2 ounces). It has a slip tip which allows the needle to fit the barrel directly. The needle is of steel, 12 cm. long, with a caliber of 2 mm., and provided with a sharp point, which is protected by a dull-tipped stylet projecting 1 mm. beyond the point of the needle. In puncturing the skin and subcutaneous tissue, the stylet is withdrawn beyond the cutting edge. It is then replaced, and the needle pushed in perpendicularly. When the sciatic nerve is reached, at a depth ranging from 6 to 12 cm., the patient may feel either a sharp pain radiating from the point of contact to the popliteal space or down to the foot; or a sharp pain in the corresponding heel; or there may occur a jerking movement of the leg; or a sudden twitch in the calf muscles. Some patients complain only of diffuse pain in the buttock. The stylet is then removed. The syringe having been filled with sterile physiological saline solution at a temperature between 95° and 100° F., the fluid is rapidly injected. The quantity used is from 80 to 120 Cc. The needle is then quickly withdrawn, the iodine washed off with alcohol, some collodion applied over the point of puncture, and this is covered with a small strip of sterile adhesive plaster. The patient is then instructed to lie abed and rest for twelve to twenty-four hours. No anesthetic is required. Strict aseptic precautions are absolutely essential. Soon after the injection, some aching pain with a sensation of heaviness and numbness in the limb usually follows, but this lasts only a short time. In some cases the sciatic pain in the thigh disappears within twenty-four

hours, but the patient complains of pain continuing in the leg in the course of the peroneal nerve. This is often promptly relieved by an injection of 15 to 30 Cc. in the region of the nerve at the head of the fibula. The interval following the first injection, before another is given, will vary according to the degree of relief obtained. The writer has been in the habit of waiting from thirty-six hours to one week before repeating the injection.

As a rule, the injection of saline solution under pressure, in quantities ranging from 60 to 120 Cc. or more, is attended with comparatively slight pain. This usually arises during the early period of the injection. As soon as heaviness and numbness in the extremity are felt, no further pain results from the introduction of additional fluid. In the majority of instances the treatment is not painful. At the time of the first injection fear and apprehension often render some patients less manageable than others. Usually, when additional injections are required, these elements of discomfort have become eliminated, and there is no further difficulty. It should be borne in mind that the object is to produce infiltration of the nerve and the surrounding structures. It is not intended that the nerve sheath should be entered by the needle. Should such a large quantity of fluid be forced into the trunk of the nerve disagreeable consequences, such as paralysis and traumatic neuritis, will probably ensue. In the construction and use of the special needle precautions are taken to avoid puncturing a blood-vessel or the nerve sheath.

THE EFFECT OF REPEATED INJECTIONS OF PITUITRIN ON MILK SECRETION.

In the *American Journal of Physiology* of February 1, 1915, SIMPSON and HILL, as the result of an experimental research, state that the administration of pituitrin, by intravenous, intramuscular or subcutaneous injection, to a lactating animal leads to a marked increase in the quantity of milk secreted and also in its fat content. In the goat, if the injection be continued at intervals over a prolonged period—several months—immunity to its action on the mammary glands appears to be established both in regard to the amount of milk yielded and the percentage of fat it contains.

DRY-CUPPING IN LARYNGEAL AFFECTIONS.

In the *Lancet* of January 23, 1915, STUART-LOW states that for some time he has been using dry-cupping of the external surface of the larynx and adjacent area of the neck with very beneficial effect in some laryngeal affections, but he can find no record in laryngeal literature of its employment for this class of disease. That dry-cupping should not have been used for the relief and amelioration of laryngeal trouble is the more remarkable since it is so readily and so easily applied, and the anatomy of the parts, particularly the blood supply, lends itself advantageously to such treatment.

The writer has had cups made of various sizes and shapes for adaptation to the front and sides of the larynx, and has found it best to have the edges of the cups covered with rubber so that any inconvenience the patient might feel where the suction is strongest may be minimized. Some of these cups are half-moon-shaped, others horseshoe-shaped. Suction can be applied effectively to one or both sides of the larynx simultaneously. There is an adjusting mechanism on the instrument by which the suction force can be varied from an equivalent of 5 to 100 pounds air pressure.

The vascularity of the larynx is favorable to the process of dry-cupping, as the vessels enter and pass out at definite sites. There are two chief and two subsidiary sources of arterial supply, and the veins and lymphatics accompany the arteries almost exclusively. The box of the larynx, chiefly made up of the two wings of the thyroid cartilage, has no vessels perforating its immediate sides, but they pass into it above and below. Above, the superior laryngeal arteries pierce symmetrically the

thyrohyoid membranes, being branches of the superior thyroid arteries. Having entered the interior of the larynx they spread out like the roots of a plant in the submucous tissue of the inner laryngeal lining. These branches are mostly directed to the posterior aspect, and in the lower half of the area of the thyroid cartilage meet similar ramifying branches coursing up from below—viz., those of the inferior laryngeal artery, which has similarly pierced a membrane, the cricothyroid. The inferior laryngeal artery is a branch of the inferior thyroid and also has its intralaryngeal branches directed to the posterior part of the lining of the larynx. While the superior laryngeal veins follow closely the same artery, the inferior laryngeal veins chiefly join the more centrally situated inferior thyroid veins. The subsidiary vessels are the cricothyroid arteries, one on each side, which spread inward from the superior thyroid arteries as they pass down to the thyroid body. These two small vessels run in horizontally from each side on the cricothyroid membrane and meet and anastomose in the middle line. Branches pass from them through this membrane and spread out freely in the lining of the anterior aspect of the larynx. There is in this manner a special blood supply given to the anterior part of the lower region of the larynx which compensates for the large distribution of vessels at the posterior part, to which the superior and inferior laryngeal arteries are mainly directed. The lymphatic vessels similarly pass through the membranes above and below the thyroid cartilage, following the blood-vessels more or less closely. Those accompanying the superior artery go into the superior deep cervical lymphatic groups of glands, while those with the inferior pass to the inferior deep cervical lymphatic groups of glands. There are other lymphatic vessels which pierce the cricothyroid membranes directly and join small lymphatic glands lying on the surface of this membrane. No vessels, either arterial, venous, or lymphatic, pierce the wings of the thyroid cartilage.

The anatomical arrangement of these arterial, venous, and lymphatic vessels has an important bearing on the application of dry-cupping. It indicates that for the most effective relief of the vascular and edematous congestion of the interior of the larynx the cups must be correctly placed anatomically to get the maximum results. The cups should, therefore, be applied over the posterior half of the thyrohyoid membrane and over the cricothyroid both laterally and in front. In this way there can be brought about a lessening of intralaryngeal congestion, both by retarding the entrance of blood and by facilitating venous and lymphatic circulation outwards, and so relieving venous and lymphatic engorgement.

FURTHER OBSERVATIONS ON PYORRHEA ALVEOLARIS.

In the *New Orleans Medical and Surgical Journal* for February, 1915, BASS and JOHNS state that they have now examined more than 200 cases of pyorrhea alveolaris in all stages of the disease, and have found amebæ present in all except one case. The diagnosis in this case was doubtful, in the opinion of the dentist who presented it, but the writers feel quite confident that the disease was surely mild or early pyorrhea. They believe that the cause of failure to find the amebæ was faulty technique, though quite thorough search was made. In one other case of Riggs's disease of moderate extent they failed to find amebæ in ideal material taken from typical early lesions. After failing to find them, the patient volunteered the information that he had been using fluid extract of ipecac as a local application with the tooth-brush for two days, according to instructions the writers had given other patients under emetine treatment.

The writers believe the conclusion is justified by their investigations that amebæ, chiefly if not wholly of the species Entameba buccalis, are demonstrable by proper technique in the lesions of pyorrhea alveolaris in all stages of the disease in all who have the disease in their locality. Their patients have been from different walks of

life and from three States besides Louisiana. They have not been able to demonstrate the amebæ in material taken from healthy gums and free from pus or pyorrhea. They have, however, found them often in material scraped from lesions which did not seem to extend to the alveolar process, and therefore could not be correctly called pyorrhea alveolaris. It seems to them certain that these lesions are the early lesions or the beginning of the disease, which later reaches the alveolar process, and finally, by destruction of the peridental membrane, leads to the loss of the teeth, and is then called pyorrhea alveolaris. What is now generally recognized as pyorrhea alveolaris, or Riggs's disease, is therefore in fact the late stage of a disease which would more correctly be called periostitis dentalis. The quantity of pus varies, no doubt, with the secondary infection that must always exist, and also with individual conditions or influences.

Bass and Johns have experimented with different doses of emetine given with varying intervals between doses, making frequent examinations for amebæ to determine, if possible, just what treatment with emetine is necessary to destroy the demonstrable amebæ. In their experience now with more than 200 cases they have found that amebæ are not demonstrable, by the technique they use, in more than from about two to five per cent of all cases after one-half grain emetine hydrochloride, given hypodermically each day for three successive days. Demonstrable amebæ disappear in only a small percentage of cases from one dose of emetine. They do not disappear, in most cases, if the interval between doses is more than twenty-four hours.

Observation of a number of patients for more than two months permits the writers now to have some opinion as to the probable certainty of the disinfection, and also the permanency of it. In about 12 or 15 per cent of cases in which amebæ could not be demonstrated just after the course of emetine, they have been found again in one or more lesions from a few days to five weeks after the emetine treatment had been given. In a few instances this was observed also in the case of patients who had applied fluid extract of ipecac when brushing the teeth, which, theoretically at least, would tend to prevent reinfection. The writers take this observation to indicate that, though the three days of emetine treatment, as recommended in their former paper, destroys the amebæ demonstrable by their technique, in practically all cases there remain a few parasites in a considerable percentage of cases. It would seem, therefore, that the emetine treatment should be continued daily for a period of from three to about six days, according to the extent of the disease in the particular case.

It should be pointed out and emphasized that the extent of the disease varies around different teeth in the same patient. It often happens that, while one or more teeth are loose and in the last stage of the disease, others are much less affected, and still others are not affected at all. The amebæ may disappear from the early lesions after only a short period of emetine treatment, but they may persist much longer in advanced-stage lesions. This is largely due, no doubt, to the amount of pus, dead and foreign material, which protects some of the amebæ from the action of emetine given hypodermically, which can only reach amebæ in contact with or near the living tissue. There can be but little doubt that washing out these large, deep pockets with emetine, one-half-per-cent solution, as recommended by Barrett and Smith, or, probably better, with a one-to-one-thousand solution of fluid extract of ipecac, would help to disinfect them of their amebæ.

Further observations have led Bass and Johns to consider one hypodermic of one-half grain of emetine given every few days after the first course of several doses, as recommended in their former paper, to be of comparatively little value. If it is necessary to repeat the emetine it should be given for at least three days, as at first. The only indication for repeating the emetine treatment is the presence of amebæ, which, of course, can best be determined by proper microscopic examination. The fact that it

is sometimes necessary to make and examine several preparations from a lesion before amebæ are found shows that even this method may be misleading, especially when negative.

It should be understood that the emetine destroys the amebæ by some specific action, but that, after the amebæ have been destroyed, the lesions remain, and will require a variable length of time to heal, according to the extent and character of the lesion, and other influences. The pocket is usually much more extensive than would be supposed, and those interested in the disease may be enlightened by passing some suitable small instrument to the bottom of pyorrhea pockets. Upon careful dissection the pocket will be found to contain necrotic and often tough tissue (especially periosteum in the bottom), and more or less carious bone. For nature to liquefy and remove this material will necessarily require a considerable length of time, during which there must continue to be more or less pus formation.

As long as the lesion is not healed up it naturally offers favorable soil for reinfection. The disease is almost universal, and, therefore, chances of getting infection from others must exist almost daily. Bass and Johns have experimented considerably with fluid extract of ipecac as a local application made by the patient for the purpose of preventing reinfection, and have learned that not only will it theoretically prevent reinfection, but it will actually destroy the amebæ present in many early lesions. The proper method of using it seems to them to be to brush the teeth in the usual way to clean, and then to apply one drop of fluid extract of ipecac to the wet brush and brush again. Force some of the solution between the teeth and spit out the excess, but don't wash it out. This ought to prevent the disease in those who haven't it, and in the light of present information all persons now free from the disease should use this specific, either in this form or possibly in some other form, as a prophylactic, instead of the many commercial preparations now in use.

ANTEPARTUM HEMORRHAGE.

In the *Clinical Journal* of January 20, 1915, STEVENS discusses this subject at length and gives advice as to what should be done in the very severe cases of accidental hemorrhage, amongst which one must include those of concealed accidental hemorrhage. The writer imagines a patient who is suffering not only from blood loss, but also from shock. She is blanched, suffers from air-hunger, and has a very quick, small pulse, showing she has lost much blood. If one examines the abdomen in such a patient, one finds the uterus hard and resistant, tender to the touch because it is stretched, one can feel no fetal parts, and one can detect no fetal heart sounds, because the child is dead. Perhaps no blood has escaped externally, and one can infer that the patient has bled at all only from her general condition.

What is to be done in the case of a patient like this, who is in such a desperate condition? If one ruptures the membranes, and lets off the liquor amnii, the pressure in the uterus will be reduced, and will allow further bleeding to take place. The bleeding may have temporarily ceased—one cannot tell that it has, but it may have, because the pressure in the uterus may have become equal to the blood-pressure, in which case, theoretically, no more bleeding should occur. But directly the membranes are ruptured, the intra-uterine pressure is diminished, and further bleeding will take place. If the cervix is undilated, one cannot dilate it under a certain number of minutes. One cannot carry out any form of accouchement forcé without running great risks of injury to the lower uterine segment. Dilating bags are useless because the paralyzed uterus is unable to contract.

Finally, during the time consumed by any of these methods, the patient may go on bleeding, and may die before delivery can be effected. If one uses the plug and binder method, he will probably be no better off, because the pressure in the uterus is already as high as one can get it, and one can get it to a higher point only if the uterine muscle begins to contract. But the

writer has shown that the uterine muscle is paralyzed and stretches before the increasing pressure of the blood-flow. Therefore the plug and binder method is not likely to do good in either stopping hemorrhage or in initiating uterine contractions. One is therefore forced to conclude that some surgical operation must be performed, and the question arises, What? The patient is in a desperate condition from blood loss and from shock. If by a surgical operation she loses more blood, the probability is that she will die.

Of course, it has been suggested—and carried out—that Cæsarian section is the proper treatment for concealed accidental hemorrhage in a severe case. It has been done successfully; it has been done unsuccessfully. But one can see at once a reason for the non-success of Cæsarian section in some cases, because no man can guarantee to perform Cæsarian section without a certain amount of blood being lost. The uterus is already full of blood, and directly it is opened of course the blood gushes out, and further bleeding occurs from the placental site. It is to be recalled that we are dealing with a uterus which will not contract, and one which is infiltrated with blood and paralyzed. Therefore the writer's view is that Cæsarian section is not the operation of election for a bad case of concealed hemorrhage.

The proper operation in such a case is hysterectomy—removal of the uterus without any attempt to interfere with its contents. By doing hysterectomy in such a case one can guarantee that the patient will not lose another couple of ounces of blood, and this cannot be guaranteed by any other operation. The uterus is not opened at all, but simply removed in its entirety. Stevens has had the opportunity of performing this for concealed hemorrhage, and also for central placenta previa, and has been exceedingly pleased with the result in both instances. To carry out any form of surgical procedure in a patient like this, who is already in the most dangerous condition that a woman can be in, requires some precaution. These precautions are: first of all, saline infusion whilst performing the operation, and secondly, the use of the smallest quantity of a general anesthetic combined with local anesthesia of the abdominal wall.

Saline infusion is best carried out by means of Lane's infusion bag—a large rubber bag to contain five pints of salt solution, which has a single tube, ending in a two-way tube, with a hollow needle in each portion. A needle is inserted under each breast, and the bag is hung up five feet above the patient. By this means one can get 1½ pints under each breast in thirty or forty minutes.

Anesthesia is best induced by the use of a combination of drugs. First, morphine and atropine hypodermically, a quarter of a grain of the former and a hundredth of a grain of the latter. Then the middle line of the abdomen should be infiltrated in three layers with 25-per-cent solution of novocaine, and in many women the operation can now be carried out without any general anesthetic at all. But as the patient is probably frightened, as well as in a severe condition of shock from blood loss, it is wise to use a small amount of general anesthetic. The writer recommends the smallest amount of ether, given by the open method, which will just keep the patient asleep. This will suffice if the abdominal muscles have been properly infiltrated with ¼-per-cent novocaine solution. The operation of hysterectomy, performed under those anesthetics, is very safe, and can be done in about twenty-five minutes by a quick operator. And at the end of the operation the patient should be no worse than at the beginning. This is no operation for the man who is not accustomed to doing abdominal surgery. But the writer is sorry to have to say he cannot offer any alternative method of treatment which can be expected to save a life in a severe case of concealed hemorrhage. Naturally, much depends on the amount of blood which has been poured out into the uterus. If it is only a small amount, then by stretching the cervix with bags, with the fingers, or with a Bossi dilator, one may be able to perform version, and extract the child by force. By

this means one might be able to save an occasional patient, but one will not be justified in expecting to save the patient by this means if she has lost a considerable amount of blood, because she will lose even more after delivery, and she will die of postpartum hemorrhage. And there is another risk which we know she must run, and which must have killed many patients in the past without our knowing it. The writer refers to rupture of the fibers of the uterus and of the peritoneum, and hemorrhage into the peritoneal cavity. We are only finding these things out now that we perform abdominal operations for severe cases of hemorrhage. We did not know them before because we very seldom had the opportunity of performing a postmortem examination on a woman who died in childbirth. Very few cases have been examined, except in lying-in hospitals, in which death has occurred from concealed or accidental hemorrhage.

So, from every point of view, if a patient can be got to a hospital, or if the services of a trained abdominal surgeon can be obtained, that must be the method of treatment for concealed hemorrhage. There is no reason for hesitation in removing the uterus, because the uterus of a patient who has once had concealed hemorrhage is only a source of danger to her.

Now let us turn to placenta previa and its treatment. Here the writer states that abdominal operations have sometimes to be performed in severe cases. He does not want us to think he considers abdominal operations are the only methods of treatment of accidental or unavoidable hemorrhage; the operation is to be performed only in certain specially selected cases.

The common methods of treatment of unavoidable hemorrhage are only two, but they are in the power of anybody to carry out.

The first method can be carried out without instruments, and with no apparatus except the operator's hands—that is to say, bipolar version: bringing down a leg, and then carrying out slow extraction of the child. Naturally, this operation can be successfully performed only when the cervix is slightly dilated and will admit two fingers, and when the placenta is partly situated over the lower uterine segment. It is not easy to perform bipolar version when we are dealing with a central placenta previa. If one can reach the edge of the placenta it is easy enough to do version. The half breech is brought into the lower uterine segment, presses against the bleeding uterine vessels, and so the hemorrhage is stopped. Therefore it is a satisfactory and successful method of treatment for what the writer may call mild cases of unavoidable hemorrhage.

The second method of treatment of placenta previa is by the Champetier de Ribes bag. It is a large bag, having a circumference of at least thirteen inches at the widest part. It is a rigid bag, having a silk basis covered over with rubber. It is easy to put it into the lower uterine segment when the os will admit one big finger easily or two small fingers.

On the whole, the use of this bag is better than bipolar version and extraction, because it gives the child a better chance. As soon as the bag is put in and filled, it stops the hemorrhage, because it compresses the lower uterine segment, and bleeding cannot take place. We can attach a weight to it so as to produce some degree of pull, and increase the pressure in that way. But it has one great danger, namely, that the natural expulsion of the bag by uterine contractions may be followed immediately by a very severe or even fatal hemorrhage. Therefore, if one is going to use the bag, he should be present when the os uteri is almost completely dilated, and take the bag out—not let it be expelled. As soon as it comes out, the hand is slipped into the uterus and version done, or the forceps put on and the head brought down. In these ways one can prevent hemorrhage, and will probably secure a good result. There is still the chance of postpartum hemorrhage in placenta previa, because the placenta, being largely in the lower segment, is attached to a part in which contraction and retraction are inefficient. Now

that we have pituitary extract, the bugbear of postpartum hemorrhage is almost done away with. The effect of pituitary extract lasts only a certain number of minutes, forty or sixty. Therefore, if one gives a full dose, one must be ready to deliver in thirty-five to forty minutes. If one can get delivery completed, then the third stage of labor will usually be concluded without risk. But if 1½ to 2 hours are going to be allowed to elapse before the delivery is effected, the state of the patient may be as dangerous as if one had not given any pituitary extract.

What is to be done for the severe cases of central placenta previa in which the patient has lost much blood? The writer relates a recent case.

A patient was admitted to Queen Charlotte's Hospital in July, 1914, having had a severe hemorrhage. She was treated by a Champetier de Ribes bag. The bleeding ceased, but in spite of that the patient remained with a pulse-rate of 140. She was pale and looked bloodless, and had obvious air hunger. By using saline and employing warm bottles and various restoratives, Stevens managed to improve her condition, so that her pulse dropped to 120. A decision as to treatment had to be made. There was nothing in the vagina, and the bag had been removed. She was having a certain amount of uterine contraction; in fact, the uterus had been in a state of tonic contraction. Directly the writer made a vaginal examination she began to bleed again. The cervix was nearly fully dilated, and was almost the size of an ordinary teacup. But she could not have been delivered in less time than five or ten minutes, and the writer could not guarantee that she would not lose another pint of blood when the placenta came away. The patient had had nine children. The present fetus was already dead, so he did not have to consider it. He therefore determined to perform a panhysterectomy without interfering with the contents of the uterus. The operation only took twenty-five minutes, and the patient made an absolutely uninterrupted recovery. The writer has since had the opportunity of doing the operation again, in a case of concealed hemorrhage, a case in which the patient had had what might have been a fatal hemorrhage, but in which, fortunately, bleeding was stopped and restoratives applied. Then came the same question. How can she be delivered without bringing about a further blood loss so severe as to kill her? She had had several children, and this child was already dead, so again the writer performed panhysterectomy. The result in this, as in the first case, was that the patient got perfectly well without manifesting any bad symptoms.

The writer does not think either of those patients could have been delivered per vaginam without further loss of blood, and if either of them had lost any considerable quantity of blood they would have died.

The writer does not want us to feel that hysterectomy is the only treatment of placenta previa, but he thinks that in certain cases in which there has been very severe blood loss which has stopped, or which has not stopped—and more so if it has not stopped—hysterectomy is the only treatment which will stop it effectually without further loss.

THE PRICE OF IODINE AND ITS PREPARATIONS.

As a considerable number of drugs have increased enormously in price in consequence of the effects of the war on both demand and supply, it is not surprising that any high price demanded for a drug should be supposed by some to be a consequence of the state of war. This is not so, however, in all cases, and iodine and its preparations form one of these exceptions. The causes of the present high price of these substances, however, are perhaps of sufficient interest to be worth a brief description. The original chief source of iodine was kelp, or the ash of certain seaweeds, and production from this material has never entirely ceased. Kelp was not originally worked for the sake of iodine alone or even chiefly; in the early days of the industry it was the principal source of

soda-ash required in glass-making and for many other purposes. The collection of the seaweed and its burning brought a return of about 35s. to 40s. a ton to the actual workers engaged in its production, and as the kelp then sold at about £20 a ton, the profit to the landowners who marketed it was enormous, and very large incomes were made.

Other and far more abundant sources of soda, however, made its production from kelp commercially impossible, but as the latter contained a considerable quantity of potassium salts, which realized a comparatively high price, the industry still paid. The discovery of immense deposits of potassium chloride at Stassfurt, in Germany, in turn brought the price of potassium salts down to a very low point, and no other source of potash has been able to hold its own against the Stassfurt mines, with the result incidentally that potash has become virtually a German monopoly, and the development of new sources of potassium compounds is an urgent need of the moment. The amount of iodine obtained from kelp was never very large, but from about 1877 a very formidable competitor has been in the field in the form of by-products of Chile saltpetre. The annual output of this mineral is enormous, and though it only contains an average of about 0.02 per cent of iodine, this can be worked up at a comparatively low cost. If all the factories engaged in the production of sodium nitrate were to turn out all the iodine which is the by-product of their main commodity, the amount would be well over 5000 tons a year. As the world's consumption of iodine is only about 500 tons a year the supply from Chile saltpetre is voluntarily curtailed, and, in order that makers may be content thus to restrict their output, a syndicate of all the principal producers was formed to control the price of iodine, and to maintain it at an artificially high level. The price being thus kept high, the less remunerative sources of production of iodine have been enabled in many cases to keep going, and a certain amount is still produced from kelp in Scotland, France, Norway, and Japan, and, in addition, there is a small production of the article in the Japanese East Indies from certain mineral waters very rich in magnesium iodide; about 24 tons of iodine were produced in 1901 from this source.

Although Japan has entered the field of iodine production comparatively recently, the cheapness of labor there has favored a considerable output, and iodine preparations of Japanese origin have for some years been obtainable on the market, usually at slightly under the prices fixed by the convention. In spite of these other sources, however, the output of iodine from South American nitrate factories is about four-fifths of the world's supply. In 1912 it was rumored that a disruption of the syndicate was likely, and a substantial drop in the price of iodine was expected; for a little time, however, nothing happened, and then the price was twice raised by substantial amounts at short intervals, the total increase amounting to 50 per cent of the previous price. It was surmised that the desire of some makers to break away from the convention had been overcome by thus greatly increasing the profit of their present output, but no reason for the increase was given, and nothing can be authoritatively stated in regard to it. The price, after these increases, for large quantities of iodine was 9d. an ounce; it is believed that a fair profit would be made if the selling price were 2d. an ounce, and it can readily be seen, therefore, that the profits must be very large.

The shortage of potassium salts, already alluded to, together with the high price of iodine, has led to hopes being entertained that the kelp industry of Ireland and Scotland might again become prosperous. A recent report of the Board of Agriculture for Scotland showed that during the five years 1907-11 the output was two and a half times as much as that of the ten years 1884-93; but, as regards Ireland, in reply to a question recently in the House of Commons, Mr. T. W. Russell stated that he had no reason to believe there had been any recent new development in regard to

this industry. As the above facts show, the syndicate is in a position at any time, if desired, to crush competition in regard to iodine from other sources, and it is therefore hardly to be expected that there will be any considerable development in the kelp industry, especially as there are several other sources of potassium compounds available.—*British Medical Journal,* March 20, 1915.

SODIUM CITRATE IN THE TRANSFUSION OF BLOOD.

In the *Journal of the American Medical Association* of January 30, 1915, WEIL reminds us of the fact that blood mixed in proper proportion with a solution of sodium citrate does not clot, owing to the fact that calcium salts are no longer available for coagulation. Such blood may be kept for many days in the ice-box without losing its oxygenating function. After one week the cells show little change under the microscope, and very slight reduction in the resistance to toxic physical or biologic agencies. After a few days there is merely tinging of the supernatant fluid. Experimentally, Weil has found that guinea-pigs or dogs may be practically exsanguinated, and can then be rapidly restored by venous transfusion of citrated blood, even if the blood is several days old. No unpleasant reactions occur. Human patients have been treated in the same way, receiving in various cases amounts ranging from 10 to 350 Cc. of citrated blood. The blood was used fresh in some instances, and in others it was from three to five days old. Such injections, he says, are perfectly well borne and produce no apparent disturbance of any kind except a transient rise of temperature and polyuria.

The method is simple. Blood is aspirated from a vein and is at once mixed with sodium citrate in 10-per-cent solution in water, in the proportion of 1 Cc. of solution to 10 Cc. of blood. Exceptionally one encounters blood which requires slightly more or less citrate proportionately. Preliminary tests, 0.1 Cc. of the solution to 0.5 Cc., 1 Cc. and 2 Cc. of blood, respectively, being used, enable one to determine rapidly the requisite proportions in any individual instance. If the mixture is made in the syringe, in cases in which not more than 50 Cc. are to be transfused, the transfer can be made directly from donor to donee. If larger amounts are to be used, the blood is expelled into a flask, from which the injecting syringes are filled. In drawing the blood, it is convenient to use a three-way stop-cock which communicates with the needle, with a 10-Cc. syringe containing the citrate, and with a large aspirating syringe.

The same method has been used for direct transfusion in dogs. The needles are introduced into the veins of donor and donee, and are both connected by a T-shaped tube with a syringe. An accessory syringe permits of the injection of the citrate solution into the tubing between the syringe and the donor's needle. The blood is alternately aspirated and expelled, the direction of the current being controlled by two stop-cocks. The apparatus is very simple, and requires the help of only one assistant.

A possible objection is based on the influence of the sodium citrate on the coagulation time of the donee. This has been tested for Weil in a series of cases by Dr. Beck. The figures indicate that the introduction of large amounts of 20-per-cent sodium citrate solution do not lower the coagulation time in the least. In fact 5 gm. of sodium citrate reduces the coagulation time by one-half. The tests have been made on blood aspirated from the vein immediately before and ten minutes after the injection. It gradually returns to normal.

The uses of this method require little discussion. For the frequent injection of small amounts of blood, it offers obvious advantages. For the direct transfer of large amounts, it may be compared with the method introduced by Satterlee and Hooker. It has, however, the obvious advantage that sodium citrate is always easily obtainable, which is not the case with

hirudin. The fact that the blood can be kept on hand for some days may be of value in cases of threatened hemorrhage, as in gastric ulcer or typhoid. Indeed, its effect on coagulation time indicates its use in hemorrhagic conditions. Essentially, the method is similar to the old method which relied on the use of defibrinated blood. It is, however, simpler than this, and avoids the effects attributed to the presence of fibrin ferment in the defibrinated blood. The possible disadvantages connected with its use can be determined only by prolonged observation.

VARIATION IN TUBERCULIN HYPERSENSITIVENESS DURING THE COURSE OF PULMONARY TUBERCULOSIS.

HOLMES, in the *Bulletin of the Johns Hopkins Hospital* for January, 1915, writing on this theme states that individuals suffering from pulmonary tuberculosis present marked tuberculin hypersensitiveness soon after the clinical onset of the disease. This hypersensitiveness diminishes if they improve, and fluctuates or remains stationary if they do not improve. More advanced cases, in time of exacerbation, present this elevated hypersensitiveness again; it rises or falls, following more or less closely the clinical course of the disease. Toward death it may rise much higher, and then fall until it fails entirely.

INTRAVENOUS AND INTRASPINAL TREATMENTS OF CEREBROSPINAL SYPHILIS.

The *Archives of Internal Medicine* of January 15, 1915, contains an article by DRAPER on this topic. He asserts that, clinically, very marked improvement occurs in all groups of cases. In the spinal types pain is usually relieved; ataxia helped in most instances, and not very markedly in a few. The bulbar types and those with fairly pronounced psychic disturbances, depending perhaps on meningeal irritation, show marked improvement in symptoms as well as in spinal fluid. The more definite psychic disturbances also may clear up completely, but their spinal fluids cannot in every case be brought to normal. The cell-count has almost always been reduced in them, but the Wassermann test rarely disappears below 0.3 Cc.

In some cases, especially those treated with serum salvarsanized *in vitro,* transient numbness in the feet had appeared; in other cases a slight failing in general robustness which may be an arsenic effect; and in several instances rather severe pains following the intraspinal injection have been seen. In two cases there has been a sudden increase in ataxia following a period of definite improvement.

Notwithstanding these undesirable features, the improvement in symptoms in almost all cases is of such striking nature that the method should be given a most careful and thorough study by numerous observers. It is, however, a procedure which must be carried out with the greatest attention to the detail of technique in all its steps, otherwise serious symptoms may be induced. At present there is sufficient evidence to show that it is unsafe to give more than two, or at most three, consecutive injections of serum to which salvarsan has been added directly. In no case should more than 0.0005 gm. be added. On the other hand, apparently any number of intraspinal injections may be given with impunity when serum salvarsanized *in vivo* is used.

In those cases which do well the rapid and satisfactory improvement may lead to a premature cessation of treatment, for the elaborateness of the procedure arouses an impulse on the part both of patient and physician to curtail the number of treatments. But with our present knowledge of the significance of syphilitic serological reactions, so long as the spinal fluid or blood gives a positive Wassermann test, the case must be looked on as one potentially capable of relapse. Consequently, no matter how well the patient feels and seems to be, treatment must be continued unremittingly until the laboratory tests are persistently negative.

IRITIS.

In the *Clinical Journal* of January 6, 1915, PISANI gives the following advice as to the treatment of iritis:

As in all diseases the indications are the removal of the cause and the treatment of the local condition. Unfortunately we are not always able to deal with the former, and we are thus often obliged to confine our treatment to the local inflammation of the iris.

Severe cases of iritis should be treated indoors; when the acute symptoms have abated the patient may be allowed out with a bandage or shade. An attack generally takes four to eight weeks to subside.

Local energetic treatment should be started as soon as the disease is recognized. The writer prescribes atropine in one-per-cent solution or ointment at first, every four to six hours, until he obtains a satisfactory dilatation, and after this three times a day until the inflammation subsides. By the dilatation of the iris not only does he compress the distended vessels in its substance, but he also ruptures the small exudates which pass from the iris to the capsule of the lens and thus prevent their being organized into dense synechiæ. Atropine also renders the pupil inactive and thus sets the iris at rest. It is seldom that the writer is justified in using atropine stronger than one per cent. Occasionally under his own supervision one or two drops of a two-per-cent solution, or even a granule of solid atropine, may be placed on the lower lid, but it is necessary to keep the puncta from carrying the tears into the nasal duct by everting the lids.

The writer is, unfortunately, sometimes prevented from continuing the atropine by the intolerance of some patients to the drug, producing toxic symptoms, at other times a follicular condition of the lids, or pain and a severe eczematous inflammation of the skin of the lids and face (atropine irritation). He is then obliged to substitute some other mydriatic, the one most commonly used being hyoscine in ½-per-cent solution. If this also is not tolerated he is forced to treat the patient without the use of mydriatics.

Relief of pain is obtained by the frequent application of dry or moist compresses, or the frequent bathing with warm boracic lotion. In severe cases great relief of pain and amelioration of the iritis follow the application of a few leeches to the temple. Ophthalmic practice is one of the few branches of medicine in which this method of treatment is used. Leeches are frequently used in the ophthalmic hospitals in London and on the Continent with most satisfactory results.

The importance of breaking down synechiæ should not be overlooked, because even if they are not extensive at first, if there are subsequent recurrences they may leave the pupil more and more bound down until secondary tension supervenes.

The writer has already explained the various ways in which tension may occur in iritis. In the case in which we have tension with a deep anterior chamber one must recollect that the elevation of tension was due to the inflammatory products interfering with the passage of the aqueous through the filtration angle. It is obvious that if one uses atropine he will further add to these difficulties by the thickened iris further obstructing the passage of the intra-ocular fluids. On the other hand, if there is tension with a shallow anterior chamber due to the iris being pushed forward against the cornea by the aqueous, which cannot pass through the pupil, then the obvious treatment is to push the atropine and by breaking the posterior synechiæ restore the passage between the posterior and anterior chambers, and if one succeeds in this the tension will disappear. What are we to do if in the former case we cannot use atropine? We first see what effect the stopping of the atropine has. If the tension is still high we may use eserine, but it is better to perform paracentesis—that is, to let out the aqueous—which not only lowers temporarily the tension, but allows the exit of the altered aqueous.

If one is unable to break down posterior synechiæ by means of atropine, and the tension is high, in order to avoid secondary glaucoma and loss of the eye operative procedures are necessary so as to restore the

communication between the posterior and anterior chambers. The writer does not deal with these operative measures in this paper.

Constitutional Treatment.—Syphilitic iritis is practically the only form of iritis which is influenced by constitutional treatment. The writer does not dwell on the treatment of syphilis, but he might mention that iritis can be effectively treated by salvarsan or neosalvarsan and the injection repeated if after three weeks the Wassermann reaction is positive. In the interval between the injections treatment with mercury and iodide is continued.

Gonorrheal Iritis.—There is no specific treatment for gonorrheal iritis. Vaccines have been used, but the result of this treatment has not hitherto proved satisfactory. Gonococcal or mixed vaccines may be used. Gonococcal vaccines, 50 to 100 millions, may be given every three to seven days; some use weaker vaccines, others starting with 200 millions weekly increase the dose every fortnight up to even 1000 millions. Sensitized vaccines by the method of Besredka are also used. Recently Nicolle and Blaizot have used a special vaccine, prepared at the Pasteur Institute in Tunis, consisting of one part gonococci grown on glucose-gelose, emulsified, well washed in a 7 per 1000 solution of fluoride of sodium, and 9 parts synococcus similarly treated (synococcus is a coccus usually associated with the gonococcus), which they claim is atoxic and does not produce an intense reaction. They have used it intravenously in adults, the injections containing 250 millions repeated every second day and subsequently doubled in strength. They have also used it in ophthalmia neonatorum, the vaccine being injected into the muscle of the buttock. It remains to be seen whether a more extensive use of the vaccine proves to be as satisfactory as is claimed.

Tubercular Iritis.—Tuberculin treatment has given, on the whole, very satisfactory results. In England tuberculin T. R. has been most frequently used, commencing with doses of 1/10,000 milligramme or more. The injections are continued weekly for two or more months; thus the patient is kept constantly under the influence of comparatively small doses.

Iritis from a Septic Focus.—The removal of the cause has frequently been sufficient. Autogenous vaccines of 100 to 250 millions or a mixed staphylococcal vaccine may be used.

PITUITRIN IN LABOR.

In the *West London Medical Journal* for January, 1915, P. A. HENDLEY states that pituitrin, or pituitary infundibular extract, is now becoming generally accepted as a valuable aid to the obstetrician. Its property of inducing strong rhythmical contractions of the uterus is so marked that it is surprising that it has not been more generally adopted by the practitioner. An experience of its use in sixty cases shows that it is necessary to observe ordinary caution in its administration, and great care should be taken where there is any obstruction. It is a very valuable aid toward shortening the long and often exhausting first stage of labor, especially in those cases in which the membranes rupture early, and a "dry labor" results. It has proved in his hands to be a powerful remedy in cases in which shock and collapse have supervened on prolonged chloroform anesthesia, not infrequently inseparable from a difficult case of contracted pelvis. In patients of a nervous temperament pituitrin has also a great influence, and the excitement is frequently calmed in an extraordinary manner. Recovery is almost invariably hastened, and patients who have previously had pituitrin nearly always ask for its repetition. He has never had a case of postpartum retention of urine since using this remedy. As a controller of hemorrhage pituitrin ranks very highly in his estimation. In one case it controlled the hemorrhage when a previous injection of ernutin had failed.

Some writers have recorded postpartum hemorrhage as a sequel of pituitrin administration, when delivery of the child did not take place until an hour or more after its administration. Hendley has observed this on a few occasions, but if a

second injection be given this does not, as a rule, occur. In any case a further dose will almost always control the hemorrhage. In one case the patient in five previous confinements had had postpartum hemorrhage, while on this occasion it was particularly noticeable by its absence.

Hendley has worked out the following technique as the best routine method for the administration of pituitrin: When the os admits one or two fingers, but not before, he injects into the gluteal muscles from 0.75 to 1.0 Cc. of pituitrin. If the child is not born within fifty minutes he gives a second injection of from 0.5 to 0.75 Cc., and repeats it if necessary. If postpartum hemorrhage supervenes a further injection will almost always control it. Care should be taken to make sure that the syringe and needle are quite free from alcohol before filling with the pituitrin, as alcohol is said to interfere with its action.

THE INJECTION OF ALCOHOL INTO THE GASSERIAN GANGLION FOR THE RELIEF OF TRIGEMINAL NEURALGIA.

The *Bulletin of the Johns Hopkins Hospital* for January, 1915, contains an article by BYRNES in which he reaches these conclusions:

1. In the treatment of trigeminal neuralgia, a single successful injection of alcohol into the Gasserian ganglion is followed by immediate relief of pain and all the symptoms indicative of its complete physiological destruction.

2. Although a general anesthetic is not administered, the painfulness of the injection is not unbearable or greater than that experienced in making deep intraneural injections.

3. In experienced hands this form of treatment is without serious risk, and no fatalities have been recorded as a direct result of the injection.

4. In spite of the contentions of Alexander and Unger, injections in man by exposure of the ganglion appear to be unwarranted and lacking in judgment, except in rare cases in which this slight saving of time may determine the immediate result during exposure of the ganglion. It is conceivable that in performing the subtemporal operation for removal of the ganglion, emergencies might arise which would demand prompt closure of the incision, or prevent further approach to the ganglion. Under these conditions, if the ganglion is in view or accessible, direct injection might be practiced; otherwise the original operation for removal or avulsion of the root should be employed.

5. If deep neural injections have been unsuccessful, and repeated attempts to inject the ganglion by the subcutaneous method have failed, an effort might be made to inject through the exposed foramen ovale before resorting to the subtemporal operation for removal.

6. It has been demonstrated, by fractional injection, that the extent of destruction may be, in a measure, limited to that portion of the ganglion from which the affected nerve trunk originates; and that not infrequently the corneal fibers can be spared.

7. From the distribution of corneal anesthesia, following partial injections of the Gasserian ganglion, it appears that the upper and lower halves of the cornea receive separate innervation.

8. In cases of bilateral neuralgia, injection of the ganglion possesses distinct advantages over other methods of radical treatment. Since anatomical continuity is not actually destroyed and the motor nucleus is not directly affected, conditions are most favorable for recovery of motor function; while sensation would be permanently lost if the ganglion is completely destroyed. Thus, by allowing sufficient time for regeneration in the motor root bilateral ganglionolysis might be safely practiced.

9. Clinical observations have been too recent to furnish reliable information as to the permanency of relief after ganglionic injections; and experimental studies appear to indicate that it is not probable that the ganglion can be completely destroyed by a

single injection of alcohol. It is the writer's opinion, however, that by repeated injections of the ganglion its complete destruction may finally be accomplished.

THE TREATMENT OF PERNICIOUS ANEMIA WITH NEOSALVARSAN.

GOSSAGE writes in the *Medical Chronicle* for April, 1915, on this subject. He concludes that one may say that the intramuscular injection of neosalvarsan affords a method of treatment for pernicious anemia by means of which improvement is likely to be more rapid and to be maintained for a longer period than was the case with the administration of arsenic by the mouth. It seems doubtful whether any permanent cure has resulted. The removal of the spleen is also followed by rapid improvement in most cases, but it has yet to be seen whether this is greater or more permanent than that resulting from the employment of neosalvarsan. The operation is naturally, considering the already grave condition of the patient, a dangerous one. Mühsam (*Berl. klin. Wochenschrift*, 1914, i, 1104) lost five out of fifteen cases from the operation itself, and the patient whose spleen was removed for the writer died within a few hours of the operation from edema of the lungs. Operative treatment cannot, therefore, be advocated as a routine measure unless the results prove to be decidedly superior to those obtained from the injection of neosalvarsan.

OBSERVATIONS ON TWILIGHT SLEEP.

BRANNAN, in the *Medical Record* of May 1, 1915, in concluding a paper on this topic says that he has felt obliged to go into this new method of treatment because it was being used so extensively in some of our hospitals. He would not, however, wish to express a final opinion until he has data from several hundred cases. At present he does not see anything to contraindicate the treatment in selected and well-conducted cases. In his judgment, however, it cannot safely be employed by the general practitioner, but should be restricted to specialists.

THE WAR AND THE SCARCITY OF SOME DRUGS.

The *British Medical Journal* discussed this subject in an interesting manner in its issue of March 27, 1915.

Probably the most serious shortage of all has been, and still is, in regard to phenol and the substances prepared from phenol, including in these salicylic acid and its derivatives. The prime cause of the shortage of carbolic acid is, of course, the greatly increased demand due to the war. Not only is carbolic acid, in common with other antiseptics, in demand for use in army hospitals, etc., but it is an essential constituent in the manufacture of explosive lyddite, a particular form of trinitrophenol or picric acid. Salicylic acid, as usually employed, is almost entirely manufactured from phenol, the amount produced from the oils of wintergreen and sweet birch, and known as natural salicylic acid, being a very small fraction of the whole quantity used. Besides the simple salicylates, of which sodium salicylate and quinine salicylate are perhaps the most in use, there are the derivatives acetyl-salicylic acid and salol (salicylate of phenol), the latter requiring phenol as a source of both parts of its molecule. At the time the war broke out no salicylic acid was made in this country; at present at least one British firm is making and selling salicylic acid and all its derivatives; but, in view of the size of the demand, the output of one firm within a few months of commencing the manufacture can have no appreciable effect on the situation. Some quantity of salicylic acid is made in France, and this is perhaps at the present moment the most reliable source of supply, although considerable quantities have up to now been obtained from Switzerland and other neutral countries.

With regard to carbolic acid itself, so many other antiseptics are available that the shortage is not very serious. Among the other substances which can be suggested for use in place of it are solution of cresol with soap, mercury perchloride, mercury biniodide, tincture of iodine, and hydrogen peroxide, and this list might easily be extended. Cresol itself, which commercially

is a mixture of the three isomers, ortho-, meta-, and para-cresol, is very closely related to phenol, being the next member of the homologous series of hydroxy-benzene compounds. Unlike phenol, it is a liquid at ordinary temperatures, but in other respects it resembles it, and it has been shown to have a markedly stronger bactericidal action. Cresol is soluble in water to the extent of two per cent, and a watery solution may very well be employed for many purposes in place of carbolic acid lotion. The most useful combination of cresol, however, is the liquor cresol saponatus, or solution of cresol with soap, which has recently been made official in the British Pharmacopœia. This contains 50 per cent of cresol with sufficient soap to make it mix freely with water in any proportion. Under the name "lysol" a similar solution has come into very wide use on account of its great convenience and germicidal effect; the word "lysol" being no longer a registered trade-mark, the preparation is widely made under this name, and many other proprietary antiseptics sold under different names have essentially the same composition. The official name, however, is practically the same as that by which the solution has for a long time appeared in the British Pharmaceutical Codex, and is the most suitable for use in prescriptions.

With regard to salicylic acid and acetylsalicylic acid and their salts, it is by no means easy to suggest suitable substitutes. It may be suggested that for the present these drugs should be reserved for the treatment of acute rheumatism and its complications only, and that for other diseases —including influenza, neuralgias, and many other conditions loosely termed rheumatic— other drugs and methods should be employed. Salol, also, by virtue of its insolubility in acid fluids and its easy decomposition in alkaline media, is an intestinal antiseptic which is not very easily replaced; several other excellent antiseptics, however, are quite suitable for employment when their effect in the intestines is required. Among these may be mentioned beta-naphthol, ichthyol, eugenol, and creosote. It may occasion some surprise that the manufacture of the important salicylic group of drugs has not been taken up on an extensive scale in this country. The process by which salicylic acid is made from phenol was originally devised in Germany; before the war it would have been very difficult to produce the salicylates here at prices which could compete with those at which Germany was able to offer them. Since the war began British chemical and pharmaceutical manufacturers have been very busy and at the same time have been seriously short-handed owing to a considerable proportion of their men having joined the new armies, and this appears to explain why, in many cases, the manufacture of new products has not been taken up.

For some time after the commencement of the war the normal supply of bromides was seriously diminished. Bromine is obtained principally from two sources, one being the deposits at Stassfurt in Germany, in which bromide is obtained from the mother liquor of the crystallization of potassium chloride; the other part of the world's supply has come chiefly from America, where bromide is obtained as a by-product in the working of rock salt. Naturally all supplies direct from Germany are now cut off, although, no doubt, a good deal of bromide of German manufacture has continued to reach us through neutral countries. The supplies of American bromide have meanwhile increased until a point has now been reached at which it is no longer necessary to restrict the use of bromide in medicine. The case is somewhat similar in regard to potassium compounds; the immense quantities of these obtained from the Stassfurt mines had reduced the supply from all other sources to negligible dimensions, but several other sources can be made available. In the United States, which has hitherto obtained its potash from Germany, a process for its production from felspar has been worked out, although it does not appear that any potassium salts from this source are as yet on the market. The Board of Agriculture for Scotland has had experiments conducted on the commercial production of potash salts from forest produce on a considerable scale, the

results showing that there is a possibility of considerable quantities being prepared in this way. In Italy it is proposed to utilize the potash which exists in large quantities in the residual liquids from the production of sugar and also from the residues of the extraction of olive oil. It is estimated that in this way at least 15,000 tons of potash a year can be produced. Of the total consumption in this country of potassium compounds it now appears that the use of potassium salts in medicine forms such a small part that any particular restriction of their employment for medicinal purposes appears to be unnecessary.

One of the most important alkaloids of which the supply is very limited at present is atropine. This, as we noted recently, has been almost entirely of German manufacture, in spite of the fact that one of the principal plants from which it is obtained, *Hyoscyamus muticus,* is grown in Egypt, and should, therefore, be very readily obtainable by British manufacturers. Economy in the use of this important substance appears to be essential, as there is no substitute except, to a limited extent, such related alkaloids as are in a similar case with it as regards supply. It may confidently be expected that supplies of non-German manufacture will appear on the market in due course, but some considerable time must necessarily elapse before this can happen. Certain artificial alkaloids, notably the local anesthetics novocaine and eucaine, are also very scarce, in spite of the fact that novocaine is stated to be now manufactured in this country. In regard to this point it should be borne in mind that a substance may be correctly stated to be made in England if some considerable part, and especially the final part, of the manufacturing process is carried out here; but in the production of a complete substance like novocaine the building up of the molecule is a process of many steps, and it may quite well happen that the earlier stages of the process are not carried out in the same factory as the later stages, and the production of the alkaloid in this country may therefore be temporarily rendered impossible by the failure of the supply of some one or more of the products necessary to its building up. Most of the local anesthetics produced artificially which have come into use in recent years have been of German origin, and the production of cocaine itself, as we have already noted, has also been almost entirely in German hands. A certain limited quantity of cocaine, however, of British make is now available; meanwhile one of the most recently introduced local anesthetics—hydrochloride of quinine and urea—is likely to find an extensive application in place of some of the substances not now obtainable, and from the results which have been recorded it may be expected that this compound will prove capable of largely extended use, its principal distinguishing characters being that it is relatively non-toxic and that the anesthesia which it produces lasts for a considerable time.

Thymol is in somewhat the same position as atropine, owing to the fact that it has hitherto been made in Germany from material grown in the British Empire. The source of thymol is oil of ajowan, obtained from the fruits of *Carum copticum;* thymol is also obtained from the oil of thyme and from a number of other plants, while the closely allied substance carvacrol, which is capable of being used in place of thymol, is obtained from the origanum oil produced in Cyprus; it can also be obtained from some other plants. The manufacture of thymol has already been taken up in this country, and it is being produced in commercial quantities; some time must necessarily elapse, however, before this new supply has a material effect in bringing down the price. Meanwhile there are many other aromatic antiseptics, such as eugenol, which can be used in its place.

Another important substance which certainly could be produced without difficulty in very large quantities in Great Britain, but has hitherto come from Germany, is adeps lanæ, or lanolin. This, as is well known, is the purified fat of sheep's-wool; enormous quantities of wool are woven in this country, and the preliminary treatment involves the removal of its fat. All that is necessary is the proper purification of this; it is not easy to see why the production of

lanolin has hitherto remained in German hands. The process was originally covered by a patent taken out by a German, but this patent elapsed a good many years ago. Quite recently British-made lanolin has appeared on the market from two or more sources, and it may be assumed that this supply will increase in the future. In the meantime it is necessary that the use of lanolin should be restricted to such ointments as cannot be equally well made with other bases.

A considerable number of synthetic medicines are among those most affected by the present state of things; of hypnotics, that in respect of which the effect seems to be greatest is barbitone or malourea, formerly chiefly used under the trade name "veronal." The reputation of this drug has undoubtedly suffered from the considerable number of cases in which fatal results had followed an overdose, and it is very doubtful if it is as much used now as twelve months ago, quite apart from any difficulty in regard to the supplies. The number of other hypnotics which are available is very considerable; it is to be noted, however, that the supplies of paraldehyde appear to be very restricted, and it is desirable that this latter drug should only be used in those cases in which it has a decided advantage over alternative products.

Phenacetine has up to now only been produced in this country in very small quantity. At a recent meeting of the Society of Chemical Industry in London a specimen of British-made phenacetine was exhibited, but it does not appear that the amount obtainable from this source is at present sufficient to have an appreciable effect on the situation. Phenazone is another substance somewhat similar in its applications to phenacetine, which has hitherto been entirely an imported product. Supplies of this have been coming lately from neutral countries, but both it and phenacetine remain very scarce. In so far as these bodies have been used as antipyretics, they can be replaced by many of the old-established drugs, such as quinine, alkali citrates, and acetates, etc., while as analgesics butyl-chloral hydrate, chlorbutol, cannabis indica, and others may find more extensive application than in recent years.

Besides those referred to above, two other products at least are no longer in danger of serious shortage, owing to their manufacture having been taken up in this country, whereas supplies were previously obtained from Germany. These are hexamine (hexamethylenetetramine) and formaldehyde. The proceedings before the Board of Trade in regard to trade-marks have elicited the fact that hexamine is now being produced in this country in considerable quantity, and although the trade-mark rights in the word "urotropine" remain, the inclusion of the substance in the British Pharmacopœia under the name "hexamine" will no doubt lead to the latter name superseding the many proprietary names under which it was formerly known, and the British-made article is therefore likely to be supplied. The production of formaldehyde from methyl alcohol has also been taken up by at least one firm in this country, and considerable quantities appear to have been obtained from America. With regard to both these drugs, therefore, it is no longer necessary to place any particular restriction on their use.

THE GERMICIDAL POWER OF GLYCERIN ON VARIOUS MICRO-ORGANISMS UNDER VARIOUS CONDITIONS.

The *Philippine Journal of Science* for November, 1914, contains an article by RUEDIGER detailing his investigations along those lines. He concludes that glycerin has a distinct although feeble germicidal action.

The germicidal action varies greatly with the temperature, being much feebler at a temperature of 15° C. than at from 30° to 35° C.

The germicidal action varies with the diluent employed; in gylcerin diluted with physiologic salt solution the microörganisms died much sooner than in glycerin diluted with bouillon or with horse serum.

In dilutions up to 50 per cent, glycerin did not destroy the bacillus of anthrax in

fifteen days. This may be due to the presence of spores.

Glycerin seems to be a selective poison for the bacillus of plague, the spirillum of cholera, and the bacillus of diphtheria.

In 50 per cent of glycerin in physiologic salt solution all the non-spore-forming organisms died in less than four days.

STUDIES ON THE THERAPEUTIC ACTION OF DIGITALIS.

The *Medical Record* of April 10, 1915, states that Dr. Alfred E. Cohn read a paper before the New York Academy of Medicine in which he said that the administration of digitalis has been difficult because there had been no specific criterion telling when the drug was effective. In the course of other studies it was found that a change in the electrocardiogram occurred, which could be used for the purpose indicated. It consisted in an alteration, sometimes an inversion, of the T wave. The change might occur as early as twenty-four hours after the administration had commenced. It might persist as long as twenty-two days after the use of the drug had been discontinued. The electrocardiogram had been seen to return to normal after five days. By the use of this sign two actions on the heart were detected, when digitalis was given. The rhythm of the heart might be changed, and the T wave of the electrocardiogram was altered. If atropine, which acted on the vagus terminals, was injected, the rhythm of the heart was restored to normal, but the change in the T wave persisted. The alteration in rhythm indicated an effect of digitalis on the nervous system; the alteration in the T wave, an effect on the heart muscle. There was, therefore, evidence to show that the action of digitalis on the heart was twofold, nervous and muscular.

Dr. A. Jacobi asked Dr. Cohn how long were the intervals between the doses he gave.

Dr. Cohn replied that the dose given was equivalent to 0.1 gramme of the powdered leaves of digitalis given four times a day. The following day he gave the same dose, so that the patient under discussion received 0.4 gramme each day. This amount was given for three days, and then 0.3 was given on the fourth day.

Dr. Jacobi said he wished to learn what practical results had been obtained from such experiments as Dr. Cohn had carried out, and what practical value they had for the general practitioner. Practitioners wished to apply what the experimenters taught them. Dr. Jacobi said that what Dr. Cohn had stated reminded him of what he had seen in his practice and particularly with the doses of digitalis he had given, sometimes small and sometimes large. He considered that the dose of digitalis Dr. Cohn had given was a sufficiently large dose if continued long enough. Smaller doses of this drug were demanded for certain purposes. The question whether digitalis was a nerve or a muscle remedy had been decided some time ago. When digitalis produced early vomiting, this should be considered the result of nerve influence. At the same time, they all knew that it acted as a muscle stimulus. He recalled a desperate case of meningitis occurring in a child of thirteen years; this patient had a high temperature and a pulse of 150 to 160. He suggested that digitalis be given, and was asked how much at a dose. He said that the patient should be given one drachm of the good tincture of digitalis as a first dose. This was given, and the patient did not die the same day, but about three weeks afterward. The dose was repeated in one-half this amount several times that day. Such doses he had frequently given and had preached about. In adults with pneumonia, when on the second or third day there was beginning edema of the lungs with cyanosis, and when in a number of cases only large venesections would give results, he had administered 10 grains of digitalis in one dose. He had found that such cases of pneumonia would not get well unless 10 minims of the fluid extract of digitalis was administered with, or at the time of, a venesection. Such cases required within three or four hours another dose of digitalis, and sometimes a third dose, three, four or five hours afterward. A number of such cases might get well with this treat-

ment subcutaneously or internally which would not recover under other treatment. Dr. Jacobi said that when he gave digitalis for a weak heart in tuberculosis, chlorosis, etc., he gave it for a long time, three or four months or more, but not the same size dose Dr. Cohn gave. He could give three, or at most five, grains a day, day after day, and he never had any cumulative effects and no arrhythmia. What he offered was the result of practical experience, and he thought that possibly it might be a guide to those gentlemen who were experimenting with digitalis.

WHAT IS THE PRESENT STATUS OF AUTOSERUM IN SKIN DISEASES?

RAVITCH, writing in the *Journal of the American Medical Association* of April 10, 1915, states that the conclusions which he has drawn may be summed up as follows:

1. Autoserum is not an ideal or an effective remedy. It was found by him to be absolutely ineffective in urticaria and chronic eczema. It gave striking results in a very obstinate case of psoriasis of thirty-two years' duration. How long the patient will be free from the eruption, time only can tell. The patient is still using a very mild chrysarobin ointment. Sixty per cent of this class did not respond at all to autoserum, while the rest of the subjects were benefited only temporarily.

2. He had as good temporary results from lecithinized serum, plain artificial serum, and injections of cacodylate of soda and mercury.

3. In psoriasis none of the serums made any impression on the disease without the use of chrysarobin.

4. Urticaria and pruritus were not materially benefited by serum of any kind. This must be due to the fact that urticaria and pruritus are in all probability due to some focal infection or internal metabolistic disarrangements.

5. A judicial and careful use of chrysarobin externally, with the employment of a suitable drug internally, is as efficient as the autoserum therapy.

It is rather a peculiar fact in the writer's experience with autoserum in psoriasis that his first cases seemingly improved more rapidly than the subsequent ones. Whether this was due to the waning of his enthusiasm and the resultant lessened confidence on the part of the patient diminishing the psychic factor, he does not know, but his method has been the same throughout his work, while the results have become less favorable.

RELATIONSHIP OF VERONAL, SULPHONAL, AND TRIONAL.

In the *Journal of the American Medical Association* of April 10, 1915, H. C. WOOD, Jr., writes as follows as to a statement made in that publication on March 20, 1915:

In the series of articles on "Practical Pharmacology" it is stated that "veronal is closely related chemically and therapeutically to sulphonal and trional," and that "its actions do not differ essentially from those of sulphonal and trional qualitatively." As these statements, which are so commonly made, seem to the writer to be demonstrably incorrect, he feels that they ought not to be allowed to pass unchallenged. Of course all of these drugs belong to the series of aliphatic compounds and are therefore in a sense chemically related, but the chemical relation between veronal and sulphonal does not seem any closer than that between veronal and chloral. For instance: the characteristic radical of sulphonal is the ethyl-sulphone group ($C_2H_5SO_2$), which is not found in veronal, while the carbamide group in veronal is not found in sulphonal. Chemically veronal is more closely related to ethyl carbamate than it is to the sulphone somnifacients.

The physiologic differences between veronal and sulphonal are equally wide. While in overdose veronal is an active poison and in several instances has caused death, fatal results from acute sulphonal poisoning are extremely rare. Moreover, the symptomatology of the poisoning is quite different. In a large number of patients veronal, even in doses not grossly excessive, will produce dermatitis; the writer has not seen any report of skin lesions following

the use of the sulphones. The characteristic symptom of chronic sulphonal poisoning is hematoporphyrinuria, which as far as he knows has not been caused by veronal. Even in therapeutic doses veronal often exercises a diuretic effect, apparently from its carbamide group; this effect does not seem to be caused by the sulphones. Other differences in their action might be pointed out, but Wood thinks these facts are sufficient to show that veronal is not closely related to sulphonal and trional either chemically or therapeutically.

OCCIPUT POSTERIOR POSITIONS.

The *American Journal of Obstetrics* for April, 1915, contains an article by ADAIR in which he thoroughly discusses this subject. As we all know, the treatment or rather the management of these cases is at times one of the most trying and difficult procedures in obstetric practice. The writer wishes to enumerate five possible methods of dealing with these cases: (1) Waiting for spontaneous delivery; (2) assisting in maintaining flexion and furthering rotation of the head by manual methods; (3) using the vectis or forceps to bring about rotation and descent of the head; (4) podalic version; (5) possibly Cæsarian section. In order to put this matter clearly these cases may be divided into three main groups:

I. The large diameter of the head above the brim, head not engaged.

II. Head in the parturient canal but above the ischial spines.

III. Head below these bony spines.

The writer considers group I first. Attempts to rectify the posterior positions by postural treatment have been of little avail. He refers especially to the use of the lateral and knee-chest positions. This group may be subdivided into cases (*a*) without and (*b*) with the membranes ruptured.

In those cases with the membranes intact nothing should be done to favor their rupture. The preservation of the membranes is important for the following reasons: Probably nothing is more favorable for a proper termination of these cases than late rupture of the membranes. A good bag of water insures dilatation of the cervix and favors rotation of the head. Lastly, if interference is necessary it is possible to perform the operation of election rather than that of necessity.

Everything possible should be done to favor strong pains, such as keeping the patient sitting or standing. Voluntary efforts should not be encouraged at this stage.

Where labor has continued for a long time with little if any progress and signs of maternal exhaustion appear, the patient should be given a rest by the use of morphine and atropine.

After recuperation, if flexion of the head is incomplete or asynclitism is present and there is much at stake, Cæsarian section should be considered, especially in multiparæ giving a history of difficult labor possibly with stillbirths, and in primiparæ. This would be true especially in cases with incomplete effacement and dilatation of the cervix.

In cases with a dilated or dilatable cervix, podalic version should be the operation of choice.

In those cases with good flexion and no asynclitism the labor may be allowed to continue, with the idea of securing better cervical dilatation, cephalic rotation, and descent. If such a case fails to progress satisfactorily the choice would lie between manual rotation, forceps, and podalic version. If manual rotation is successful the case may go on to spontaneous delivery. If after manual rotation the head does not remain in its new position, forceps may be applied to hold it and delivery completed with the occiput anterior. If manual rotation cannot be accomplished with the head well flexed, podalic version is the operation of choice.

In the second subdivision with the membranes ruptured we have a different problem with which to deal. The escape of fluid should be prevented as much as possible by having the patient in a horizontal position. This may save the child.

The cases in which rupture has taken

place just before interference is undertaken may be regarded as belonging to the preceding subdivision.

In those cases in which the amniotic fluid has drained away we have practically only three courses to pursue—waiting, artificial dilatation of the cervix, maintaining flexion and securing rotation of the head, and lastly the use of forceps. The writer always has another procedure to fall back upon which he has not as yet mentioned: that of a mutilating operation on the child.

Podalic version and Cæsarian section are both excluded, the one on account of the danger of uterine rupture and the other because of technical difficulties and the risk of infection.

In group II the same subdivisions may be recognized. In these cases the cervix is either fairly well dilated or dilatable.

In cases in which the termination of labor is necessary from exhaustion of the mother, threatened danger to the child, or a stationary head, the procedure to be followed should depend upon the amount of amniotic fluid in the uterine cavity and the position of the head.

In the first subdivision, where there is plenty of amniotic fluid, three methods of delivery should be considered as proper: First, flexion and rotation of the head by manual methods; second, delivery by forceps; third, podalic version. Which of these methods is to be selected depends largely on the position of the occiput. If it lies posterior or in the transverse diameter manual rotation and flexion of the head should be tried, and if successfully accomplished forceps should be applied. If the attempts at rotation are unsuccessful, podalic version should be done.

If the occiput is anterior, the forceps operation should be done. Where the amniotic fluid has been lost manual rotation should be tried; if successful, the instruments may be applied with the occiput anterior. If unable to rotate the head manually, one is confronted with one of the most difficult of forceps deliveries and should strive in every possible way to avoid delivery with the occiput to the rear. Traction on forceps with the head in this position tends to extend rather than flex the head and makes a difficult situation still more difficult.

The proper procedure would be to make a pelvic application of the forceps, and by proper traction away from the occiput seek to rotate the occiput anteriorly. If this is successful the forceps are removed and a cephalic application made and the child delivered.

In group III there is usually complete dilatation. There are practically only two methods which can be used: (1) manual rotation; (2) forceps. If the occiput is anterior and indications are present for completing the delivery, a simple low forceps is all the procedure necessary. If the occiput is posterior, manual rotation may be tried, but it is very difficult; if successful, it is easy to complete the delivery with forceps. If manual rotation fails the forceps may be used as described above to effect the delivery, or if this is not easily accomplished the head may be carefully delivered with the occiput to the rear.

In conclusion, the writer would like to emphasize the importance and difficulties of these posterior positions. It seems to be a phase of obstetrics which is in need of more careful study that proper indications and modes of procedure may be more fully and firmly established.

AN EXPERIMENTAL STUDY OF LAVAGE IN ACUTE CARBOLIC ACID POISONING.

The *Bulletin of the Johns Hopkins Hospital* for April, 1915, records a research by MACHT on this topic from which he concludes:

1. The efficiency of lavage in phenol poisoning depends on the quantity of poison taken, on the time after poisoning that the lavage is begun, and on the solution used for washing the stomach.

2. A strong solution of sodium sulphate appears to be the most useful for the purpose; next in efficiency comes plain water.

3. The influence of alcohol in phenol poisoning depends on the time of its administration. An animal that is previously

intoxicated with alcohol can withstand better the effects of phenol taken afterwards. On the other hand, alcohol administered to an animal after poisoning with phenol will aggravate the symptoms and hasten death.

4. The use of alcohol in carbolic acid poisoning should therefore be strongly discouraged.

TREATMENT OF THE PNEUMONIAS.

The *Journal of the Missouri State Medical Association* for April, 1915, contains an article by DULIN in which he insists that an important item in the treatment of both forms of pneumonia is the food supply. Milk is still regarded as the ideal diet so long as tympanites is absent. Soft-boiled eggs, custards, junket, and soft milk-toast fit in admirably. An adequate supply of drinking water is very necessary and is almost as important as the flooding of the patient with fresh air. Castor oil is said to be the best preliminary cathartic. After this has acted thoroughly the bowels should be moved by enemas every day or every second day. Tympanites should be prevented by the use of a proper diet, avoiding food that may lead to retention and putrefaction. If tympanites is present it should be removed by the high rectal tube, high asafetida enemas, or turpentine and soap-suds enemas. Hot water or turpentine stupes may be applied to the abdomen and will often prove of benefit, and turpentine may be given per orem. Putty-like proprietary preparations should never be used in any form of pneumonia, the skin should be kept clean; a good nurse can sponge the body morning and evening or oftener if necessary at regular intervals for high temperature. This will also be restful and gratifying to the patient. The water may be hot or cold, as selected by the patient. Dry cupping is in order in either form of pneumonia, and should be followed by hot turpentine fomentations for fifteen or twenty minutes at a time.

In the second stage of a croupous pneumonia, when the face is cyanotic, congestion of all the organs, and a laboring, dilated and distended right heart, venesection may save life or at least relieve the immediate condition. In bronchopneumonia a bleeding is seldom indicated. The patient needs all the blood he has to continue life. Venesection may hurry the case into the coffin. When cerebral symptoms are present the ice-cap to the head may quiet the patient. By some, alcohol is no longer considered a cardiac tonic. It is charged with being a cardiac muscle poison and a vasomotor paralyzant, but all the same it still remains a routine remedy with the great army of internists. Dr. Robert M. Wilson is opposed to the use of alcohol in the pneumonias, and he says of the crisis: "This interesting and very little understood phenomenon and period are full of danger as well as promise for the patient. Radical changes take place suddenly both in the tissues and in the functions of the body and the resulting shock to the vital centers is severe. The sudden fall of temperature and tremendous expenditure of nervous and chemical energy entailed in the final overthrow of the toxemia, and the almost instantaneous relaxation of the tired heart, must be met by artificial warmth, by absolute rest, and sometimes by the use of cardiac stimulants, especially by atropine. The external application of heat (hot blankets, hot-water bottles, etc.), hot water or lemonade given internally, and the cessation of all active treatment for the moment will enable the patient as a rule to pass through this narrow channel into the harbor of final safety."

Sometimes the convalescence of a severe pneumonia, especially of the bronchocatarrhal type, is by no means an easy road to travel. The toxemia has poisoned every tissue, falling heavily upon the heart and kidneys. Rebuilding of vitality and energy requires time. Resolution is sometimes arrested in the consolidated lung which is difficult of explanation. In such a case counter-irritation, blister, dry cupping, and iodine applications are worthy of trial. It may be mistaken for a pleuritic effusion.

In conclusion, in the writer's opinion, the vast majority of croupous or catarrhal pneumonias, especially if previously healthy and strong, ought to recover. The pre-

liminary purgation, after which enemas to move the bowels, and antiputrefactive diet in many cases, with good nursing, are the main requirements. Symptoms should be met as they arise or are anticipated. Purging, diet and bathing are the watchwords of the ancients. Add cold and warm clean air to this triad, and you have before you the outline of the most successful treatment of the most treacherous and dreaded forms of systemic and pulmonary disease.

SOME REMARKS ON ENDOCARDITIS IN CHILDREN.

In the *Long Island Medical Journal* for April, 1915, BARTLEY expresses his belief in the view that the tonsils are the chief port of entry for the infections liable to cause cardiac disease, and therefore the importance of tonsillar infection becomes self-evident. It would be of interest to know if the wholesale examination of throats in schoolchildren by the inspectors of the Department of Health will limit these accidents to an appreciable extent. The writer has no data upon the subject, and it may be rather early to expect much in that direction as yet. A child who has one attack of rheumatic fever, or who has had recurrent attacks of follicular tonsillitis, should certainly receive attention as regards this possible source of the rheumatic infection. However, we must not suppose that every infected tonsil will cause cardiac disease, but we must admit that some do. Until we know more of the nature of rheumatic infection we can do nothing more than this to prevent it except to promote the general health.

The treatment of endocarditis in children resolves itself into two parts: first, the treatment of the acute attack; and secondly, the management of the case after the acute attack, when valvular or myocardial injury has been done. The chief line of treatment in the acute attack is to rest in bed as long as there is any fever, and after that as long as there is any abnormal frequency in the pulse-rate, or the least irregularity. The frequency and rhythm are the things to be carefully watched. When the pulse-rate comes down to or below 100, and is regular in rhythm, the child may be allowed to sit up in bed and have his playthings. This will usually require from four to eight weeks. Salicylates and alkalies are the best drug treatment. We may then cautiously let the child out of bed, watching the heart-beat on slight exertion. When the child is out of bed, with a murmur remaining, it is a matter of judgment as to the amount of exercise allowable. It is then that the trouble often comes. The family will either be too cautious and deprive the child of needed systematic exercise, or they will allow too much freedom. The rate and regularity of the pulse is the best guide in allowing exercise. Anemia will most likely need treatment, and the digestion must be watched and kept in proper condition. If compensation is good, graduated exercise in the open air should be indulged in for the sake of the general health. Throat inflammations should receive immediate treatment when they occur, as our best, and almost our only, means of preventing recurrences of cardiac attacks.

GALL-STONES.

The condition of the gall-bladder, discovered in the course of 1066 operations for pelvic disease, is the basis of a paper by PETERSON (*Surgery, Gynecology and Obstetrics,* March, 1915). In each the immediate cause of the operation was not in the gall-bladder, but in the pelvis, and gall-stones and other disease of the gall-bladder and the biliary passages were present as incidents to the pelvic disease, the diagnosis being arrived at through routine palpation of the gall-bladder region by way of the lower abdominal incision.

Among these patients gall-stones were found 135 times or in over 12½ per cent of the cases. He concludes that except where contraindicated by the condition of the patient or the possibility of contaminating clean peritoneum, the gall-bladder should always be palpated when the abdomen is opened for pelvic disease. Hence

the small abdominal incision should give way to one large enough to permit of thorough exploration of the abdominal cavity. Gall-stones will be found incidental to pelvic disease in 10 to 15 per cent of the cases. Their frequency will depend upon the ages of the patients more than upon the variety of the pelvic disease. As with gall-stones in general, in women with or without pelvic disease, the older the patient the more liable is she to have gall-stones.

Gall-stones are much more common in women who have had children; in the present series of cases 84.4 per cent of the 135 women with gall-stones incidental to pelvic disease had borne children.

When gall-stones are removed at the time of pelvic operations, from 85 to 90 per cent of the patients will have no subsequent symptoms referable to the gall-bladder, provided the proper technique be employed. When gall-stones are not removed either because their mere presence is not thought to warrant their removal or because the condition of the patient forbids further operative procedure, 30 per cent of the patients will suffer subsequently from gall-stone attacks or other symptoms referable to the gall-bladder.

Therefore, since gall-stones are always liable to produce symptoms and at times are a distinct menace to the patient, they should be removed when the abdomen is opened for pelvic disease, if this can be done without much additional risk to the patient.

A NEW APPLICATION OF PYELOGRAPHY.

YOUNG (*Boston Medical and Surgical Journal,* April 15, 1915) states that collargol is an absorbable renal poison when used in the kidney pelvis. He notes that an emulsion of argentide is a clean, non-absorbable, opaque fluid and that its employment is attended with the minimum of danger to the patient and the maximum of satisfaction to the surgeon. This emulsion is made up by taking 100 grains of quince seed and macerating for twenty-four hours in 8 ounces of water with frequent agitation, the seeds not being crushed. Thereafter the fluid is strained through a cloth and 2-per-cent boric acid solution is added up to 20 ounces. Enough of this mucilage is added to 12½ Cc. of argentide to make 50 Cc., and is vigorously shaken for two minutes. Shaking is an essential part of the process. The resulting emulsion lasts for several weeks and is a thin, clear fluid flowing through a ureteral catheter. The solution is washed out from the pelvis after the picture is taken. It gives a much denser shadow than collargol.

STUDY OF JOINT-BODIES.

HEINECK (*Chicago Medical Recorder,* April, 1915) summarizes a lengthy paper on this subject as follows:

Primary joint-bodies occur in joints otherwise normal or presenting only such anatomical changes as are secondary to the presence of joint-body or bodies.

Joint-bodies occur in the white and colored races, in both sexes, and at all ages. They are met with maximal frequency in the male sex and during the third and fourth decades of life.

They are single or multiple, free or pedicled, and involve one or more similar or dissimilar joints. They may coexist with extra-articular bodies and with various pathological peri- and extra-articular conditions.

Joint-bodies vary as to nature, shape, size, mobility, surface characteristics, and as to relation to articular bone-ends and synovial membrane. All undergo, sooner or later, degenerative anatomical changes. All determine, sooner or later, degenerative anatomical changes in one or more or all of the structures constituting the joint.

Joint-bodies, organized blood-clots excluded, are composed of one or more of the constituent tissues of the joint. In structure they are of a fibrous, lipomatous, osseous, cartilaginous, osteocartilaginous, or mixed nature. The joint-bodies reported were chips or fragments of bone, of cartilage, masses of thickened indurated connective tissue, organized blood-clots, fibromata, lipomata, chondromata, or osteomata.

The knee and the elbow are the most frequent seats of joint-bodies; joint-bodies in other articulations are clinical and pathological rarities.

Joint-bodies are found over five times as often in the knee as in all the other joints put together. All bilateral cases reported in the literature are knee cases.

Violence is the first and foremost etiological factor. It may be direct (bumps, blows, falls, etc.), or indirect (torsions, efforts, sprains, strains, etc.), slight, moderate, or severe, and cause, in addition to the joint-body, other articular and periarticular injuries. In exceptional instances, joint-bodies result from an inflammatory or neoplastic process.

Cases of joint-bodies are not infrequently unrecognized, misdiagnosed, and, as a result, subjected to injudicious and, at times, actually injurious treatment.

Joint-body symptoms are referable to: (*a*) The injury causative of the joint-body. The causative injury determines symptoms of acute articular and periarticular joint inflammation, symptoms analogous to those occasioned by strains, sprains, contusions, fissures of cartilaginous articular surface, and other joint traumatisms. (*b*) The joint-body proper. Joint-bodies proper determine one or more of the following symptoms: pain and tenderness, swelling, crepitus, effusion, disability, locking. These symptoms are merely suggestive of the condition which we are discussing. If the joint-body be palpated, the diagnosis is absolute. If the existence of the joint-body be demonstrated by the fluoroscope or skiagram, the diagnosis is manifest.

The secondary articular changes induced by the presence of the joint-body cause symptoms varying from slight to complete joint crippling. Repeated attacks of joint locking and recurrent hydrarthrosis are responsible to a large degree for the deviations from the normal in contour, attitude, and measurements of the affected articulation, and also for the impairment of joint function.

An attempt should always be made to diagnose not only the presence of joint-mice, but also their number, location, nature, and other characteristics.

Roentgenography is an invaluable aid to diagnose the presence, number, location, and many characteristics of joint-bodies. The *x*-ray examination should include an anteroposterior and a lateral view. Stereoscopic radiographs are to be preferred. Joint-bodies may exist though the *x*-ray plate be negative. If a joint-body from within be not the seat of calcific deposits or contain no osseous portion it will cast no shadow upon the *x*-ray plate. *X*-ray findings have merely a confirmatory value.

The only relatively frequent condition which is difficult, at times, to differentiate from joint-bodies is a partly or completely detached or ruptured semilunar cartilage. This condition also calls for an arthrotomy; therefore the mistaking of a joint-body for a detached or ruptured semilunar cartilage, or *vice versa,* is not a significant diagnostic mistake.

Primary joint-bodies, irrespective of origin, location, nature, volume, number, mobility, or surface characteristics, invariably impair, sooner or later, the anatomical and functional integrity of the articulation which harbors them.

Joint-bodies should invariably be removed by an open operation, using that incision which gives best access to the joint-body or bodies and articular structures. Chronic synovial effusions are dangerous to the integrity of the joint and justify the very slight risks which attend modern aseptic methods.

Important operative points are: (*a*) General anesthesia. (*b*) Use of an Esmarch constrictor which is removed immediately after ablating the joint-body and before suturing the capsular wound. (*c*) Incision parallel to the long axis of the limb. (*d*) Location and length of incision determined by the site, size, and number of the joint-bodies. (*e*) Removal of joint-bodies by aid of instruments. Intra-articular manipulation should be reduced to a minimum. (*f*) No joint irrigation. (*g*) No joint drainage. (*h*) Separate suture of capsular and cutaneous wounds.

The removal of joint-bodies is an operation of great simplicity, having no morbidity and no mortality. If an arthrotomy be performed with aseptic precautions, the risks to the articulation, immediate or remote, are *nil*.

The removal of joint-bodies is followed by more or less complete anatomical and functional recovery. In cases of long standing, the return of complete functional integrity is not always immediate.

No one should be allowed to go about suffering from primary loose or pedicled joint-bodies. Operation cures the condition and in a large majority of cases leads to a complete return of anatomical and functional integrity.

CYTOLOGY OF CEREBROSPINAL FLUID.

BIGELOW (*Cleveland Medical Journal*, March, 1915) notes that the most frequent pathological condition found in the cerebrospinal fluid is an increase in number, often accompanied by a change in character, of the cells floating in it. Normal fluid contains few cells: from one to two to the cubic millimeter of a small round type with little or no cytoplasm visible around the nucleus. Hemorrhage in the dural sac or on an internal surface of the brain results in an increased number of leucocytes and the presence of red blood-corpuscles in the fluid. Every inflammatory process which involves the meninges or ependyma seems to produce an increase in the cell count, depending in degree upon the severity, extent, and, possibly, the situation of the process, granting that the fluid for examination was obtained from the lumbar region. Herpes zoster shows a moderate increase. Paresis shows a cell count ranging from 5 to 250, with an average of 31 per c.mm. Treatment with large doses of potassium iodide causes a temporary increase of cells in some cases; and with mercury or salvarsan a decrease in most of them. Convulsive seizures are usually accompanied by a decrease. Suppuration produces a decrease in cell count in these cases—that is, if the infected region be not directly associated with the central nervous system, as for instance if the toe be involved. Tabes dorsalis shows counts ranging from 11 to 122, with an average of 56. Cerebrospinal syphilis shows a count ranging from 1 to 514, with an average of 86. Leucocytes are more common than in paresis, this form being characterized by a great preponderance of the lymphocytes. Acute meningitis shows a very high average count. Tuberculous meningitis showed counts that corresponded rather closely with the extent of involvement. Death is usually followed by an increased cell count. As to the possibility of reducing the cell count to normal by repeated puncture when there is a moderate excess, as in paresis, this might result temporarily if one set out deliberately to bring it about, but it seems hardly possible for it to occur under ordinary conditions. The cerebrospinal fluid should be examined within six hours of the time it is obtained, since otherwise there is a decrease of 13 per cent in the number of cells. After twelve hours the decrease is 40 per cent. This is probably due to the continuation of the destructive action of the fluid, which is constantly reducing the number of cells.

THE PREVENTION OF KELOIDS IN SCARS.

FREEMAN (*Annals of Surgery*, May, 1915) employs the free transplantation of fascia lata as a means of preventing scar tissue in wounds. He quotes the case of a woman with a large disfiguring scar extending from the mastoid to the center of the clavicle, as wide and as thick as the thumb. A strip of fascia lata was procured from the thigh, long enough to reach from the mastoid almost to the clavicle, with the head in the median position, and about as broad as one's finger. After extirpation of the scar the transplanted flap was fastened to the skin and fascia on one side and the deeper tissues on the other side with a few sutures of fine catgut, thus permitting the union above it of the integument and

cervical fascia without danger of displacement. Posterior to the long scar thus treated there was a shorter one which was hypertrophied and red. This was also excised, but was not underlined with fascia lata, although the deep fascia was carefully sutured. Hence this second scar became a sort of "control experiment."

At the end of over twelve months the results of the procedure are as follows: When an attempt is made to incline the head to the opposite side, the movement is checked by the strip of fascia lata, which stands out plainly beneath the skin. This does not inconvenience the patient, because the same check was produced to even a greater extent by the false keloid. There is absolutely no pull upon the new scar, which is soft and freely movable upon the surface of the underlying graft. There is little tendency to hypertrophy or redness, except near the clavicle, to which the fascial strip unfortunately did not quite extend. The new scar is relatively inconspicuous and entirely to the satisfaction of the patient. It is interesting to note that the smaller posterior scar which is not underlined has become markedly red and elevated, while the longitudinal scar upon the thigh from which the graft has been obtained is fiery red and almost as broad and thick as one's little finger.

THE PINEAL GLAND.

McCord (*Interstate Medical Journal,* April, 1915) notes that what is now the pineal body was probably in earlier evolutionary stages a parietal eye or a pair of eyes. Only in a few species of lizards does this organ approach functional activity. The melano-pigment of man still suggests its earlier color function. This gland is situated in the brain just beneath the splenium of the corpus callosum. It exhibits a nearly trilateral shape, with the base anterior and directed forward over the third ventricle, lying close to the communications between the third and fourth ventricles and the cerebellar and pontine spaces, and in direct contact with the large venous channels that drain the central region of the brain. Hence, in enlargements of the pineal, circulatory disturbances will develop first, with the formation of varying degrees of hydrocephalus. The hydrops may develop with extraordinary rapidity or slowly. It is undoubtedly conditioned by at least two independent factors —pressure on the veins of Galen, and obstruction to the aqueduct of Sylvius. There are also reasons for believing that growth in this region further stimulates the production of cerebrospinal fluid, in which case an additional factor for hydrocephalus development comes into consideration.

There is acceptable evidence of the glandular nature of the pineal though the glandular elements are scant and ill defined. The gland shows signs of involution before the age of puberty, the first symptoms being observed as early as the seventh year; the concretions known as pineal sand, or acervulus, which consist of calcium phosphate and calcium carbonate, are found in the glia layer which covers the commissura habenularum. A conspicuous feature is the great vascularity of the body. The sympathetic nerve fibers have been demonstrated in the substance. The degeneration never becomes complete, and the histological picture of the adult gland is not such as to remove the possibility of a physiological function in adult life. The removal of the gland experimentally is extremely difficult. Sarteschi concludes that in rabbits pinealectomy, whether it be complete or incomplete, determines a great bodily development, sexual precocity, and a notable enlargement of the testes. Foa reports the production of an increased development of the testes and the crest in young cocks. There are no changes upon the removal of the glands in adult animals.

The immediate results attending the intravenous administration of extracts from the pineal gland are not usually pronounced. Such phenomena as a decrease in arterial tension, dilatation of the blood-vessels, altered rate and amplitude of the heart-beat, diuresis, glycosuria, increased mammary secretion, have been reported and confirmed. The administration orally or

hypodermically of pineal gland tissue is reported to induce developmental changes similar to those usually associated with pineal gland deficiency. In young animals the most pronounced effect of pineal administration is a rapid growth of body, but children of low mentality when treated with such material do not exhibit rapid body growth, but do improve mentally. Only young children from ten to fifteen years of age are influenced by such treatment. Neoplasms of the pineal gland are rare, and only a low percentage of authentic cases have shown the results of derangement of the gland's secretory functions. The precocious macrogenito-somatic syndrome is only found in the prepuberal age and is more complete in young males than in females.

Manifestations of unusual development in patients with pineal tumors have in most instances been attributed wholly to perversion of the pineal's functions. In the light of recent advances there are many indications of a pluriglandular involvement. Divergent findings in these cases are made more harmonious by considering the influence that other glands may exert in the production of the clinical picture. The hypophysis is very likely to become involved.

Whether neoplasms of the pineal retard (hypopinealism) or increase (hyperpinealism) functional activity is a matter of divergent opinion. Experimental evidence is available, supporting either contention.

ETHER-OIL COLONIC ANESTHESIA.

LUMBARD (*Surgery, Gynecology and Obstetrics,* May, 1915) calls attention to the fact that this method of anesthesia is especially suited to head and neck operations. His technique differs from Gwathmey's in these respects: He uses no oil as a cathartic before giving the anesthetic; he uses no preliminary bowel medication.

The ether and oil are thoroughly mixed by shaking them in a bottle for one minute. The bowels are moderately cleared by compound licorice powder. They are then irrigated with plain water until the return is clear. This should be done two hours before operation. To make sure the bowel is empty a large rectal tube is introduced and the patient assumes a squatting position. A hypodermic of morphine and atropine should be given one-half hour before the anesthetic solution is administered. The patient remains in a quiet, darkened room until the anesthetic has been administered. Thirty minutes after the morphine and atropine the patient should be placed upon the left side with knees well drawn up. A small, well-oiled, soft-rubber catheter is passed into the rectum for about three inches, and through a funnel attached to its outer end the anesthetic is slowly poured, taking about five minutes to introduce about eight ounces, which is the maximum dose—usually one fluidounce to every 20 pounds of the body weight. The mixture is composed of three parts of ether and one part of olive oil by measurement. These solutions are in turn poured into a bottle which is corked and well shaken for one minute. This thorough mixing is highly important. After introduction of the mixture the catheter is slowly withdrawn and pressure made over the anus with a hard-rolled bandage to prevent any expulsion of the anesthetic. Signs of sleep followed by signs of anesthesia usually take place in from five to twenty minutes. When signs of anesthesia are present, the pressure over the rectum should be removed and the patient placed on a stretcher and taken to the operating-room.

Should anesthesia be delayed over fifteen minutes, place a wet towel over the face, and if needful give a few whiffs of nitrous oxide or ether by the closed method. Should sudden or very deep anesthesia occur the rectum should be immediately emptied with a large rectal tube having perforations at the sides and one at the end. To do this incline the operating table with the head up, at the same time massaging the abdomen and establishing a free airway with Lumbard's controller of the tongue and palate. Should respiration cease artificial respiration is taken up, supplemented by the use of a gas-bag contain-

ing equal parts of carbon dioxide and oxygen.

The rectum should be emptied during the last part of the operation. As soon as the patient returns to bed the bowel is irrigated with tepid water until the return does not show any ether-oil, and three ounces of olive oil are introduced and allowed to remain.

The author, having had 90 cases with 18 different surgeons, feels justified in recommending the extended use of this method in head and neck operations. He has never known of any rectal irritation due to the method. He summarizes some 31 cases, including thyroidectomy with profound hyperthyroidism, cleft palate, cancer of the tongue and neck, Jacksonian epilepsy, and tubercular glands of the neck. The length of operation varied from half an hour to two hours. The quantity of the mixture employed was from 180 to 300 Cc. Other anesthetics were needed in 11 cases. There was no disturbance of pulse or respiration during operation. The time of recovery after operation varied from one-quarter hour to three hours. There was no nausea or vomiting in 28 of the 31 cases.

GALL-STONES AT BOSTON CITY HOSPITAL.

HUBBARD and KIMPTON (*Annals of Surgery*, May, 1915) gives the following conclusions from 400 cases of gall-stones entering the wards of the Boston City Hospital in the years 1907 to 1913. Only such cases have been used in this study in which stones were found at operation—226 cases. The remainder were either sent home unoperated or were operated upon and no stones found.

Of 220 cases operated upon, 55 were males and 182 females. The majority of the male cases occurred in the fourth decade, and 60 per cent came between thirty and fifty years. The majority of the female cases came one decade earlier, between thirty and forty years. Typhoid is mentioned as having been present in the history of 25 cases—12 males, 13 females. The percentage of men who have had the disease is much greater than that of women.

Indigestion for some time previous to the operation is mentioned by 30 patients. Digestive upsets varying in severity from chronic to acute, severe enough, however, to have been noted by the patient, may be found in the histories of more than two-thirds of the cases. Pain of a severe type is always a prominent, one might say the prominent, symptom, occurring in 212 cases. The right hypochondrium and the epigastrium are the most common seats. It is to be noted, however, that it may occur in the left side. The pain radiated to the back in 46 cases; right shoulder 24; epigastrium 5; right hypochondrium 2; both shoulders 1; between shoulders 4; in 46 per cent of the cases having pain as a symptom, the pain is described as radiating to other parts of the body after having become intense at its starting-point. The regions most referred to are, first, the back, 46 cases, or 45 per cent; and secondly, the right shoulder, 24 cases, or 23 per cent.

Vomiting is the second prominent symptom, present in 62 per cent, varying from mild to severe, persistent and most distressing. Vomiting is often said by the patient to bring temporary relief. The third symptom in frequency is jaundice, varying from a yellowish discoloration in the eyes to a definite yellow tinge to the whole body. This is mentioned in the history of physical examination in 107 cases. Of the 107 jaundiced persons 70 had stones in the gall-bladder only; 25 had stones in the common duct only, or in addition to stones in other portions of the biliary tract; nine in the cystic duct alone, or in conjunction with stones elsewhere; and in three the stones are described as being in the "ducts." These figures impress the fact that the presence or absence of jaundice gives no real aid in determining the situation of the stone.

Chills were infrequent. In every case in which they were noted the gall-bladder was acutely inflamed. In 14 cases in which the stools were described as clay-colored or white, stones were found at operation in the common duct in five cases, and no stones

were found in the common duct in eight cases. In five of these eight the subsequent history is known, and in some of them suggests that stones are still present. The presence of clay-colored stools furnishes suggestive though not positive evidence that a stone is in the common duct.

AN ANALYSIS OF A CONSECUTIVE SERIES OF CASES OF VARIOUS FORMS OF ARTHRITIS, TREATED BY ILEOCOLOSTOMY OR COLECTOMY.

FAGGE and HUGHES (*British Journal of Surgery*, Volume II, No. 8) have had access to all the notes of cases operated upon by Sir Arbuthnot Lane between 1909-1914 which represent instances of tuberculous disease, multiple arthritis of an infective or rheumatoid type, and Still's disease. In the majority short-circuiting only (ileocolostomy) was performed. A circular letter was sent to all patients asking them to fill in answers. In all, 33 operations were performed, and death followed in eight; of these, two died shortly after operation, one, a case of rheumatoid arthritis, of pulmonary embolism on the thirteenth day, and the second, one of tuberculous disease of the sternoclavicular joint, of peritonitis on the twelfth day.

Two cases of tuberculous hip died, one three weeks and the other of lardaceous disease four months after short-circuiting; two cases of spinal caries died, one at home three months after short-circuiting, and a second of an empyema, the nature of operation and interval before death not being recorded.

A third case of tuberculous hip died fifteen months after operation, but the cause of death has not been ascertained. A case of Still's disease operated on in Great Ormond Street Hospital is reported to have died; but the nature of the operation and interval before death are not stated.

Operation was undertaken in 23 cases for the cure of tuberculous joints; 19 of these were children and four adults; of these six died, five children and one adult. Of the 17 cases surviving, four attended for inspection, three were reported on by their doctors, two replied to the circular letter but could not attend, and eight could not be traced.

A perusal of the reported cases fails to show any beneficial effect accruing from the ileocolostomy. Three cases of Still's disease were operated upon; one died after readmission for acute intestinal obstruction with gangrene of the small intestine; one has been lost sight of; the third was seen at Guy's in August, 1914, having been operated on the year preceding. The results of multiple arthritis are more satisfactory, but inspection of these cases fails to demonstrate in any instance that an equal return to health might have been reached by ordinary surgical means without the ileocolostomy.

TETANUS AND ANTITETANIC SERUM.

IRONS (*Journal of the American Medical Association*, May 8, 1915) reports on 14 cases of tetanus. Six recovered, and it is important to note that one of these six had an incubation period of four days. Under any method of treatment there is a certain percentage of recovery in tetanus characterized by longer incubation, but a fatal termination is an almost invariable rule when the incubation period is less than five days. The patient with a four-day incubation suffered from a wound of the head, was twenty-two years old, and had exhibited symptoms for two days before his treatments. He received 18,000 serum units by subcutaneous injection. The author states that from animal experimentation and the results in veterinary medicine it is evident that antitetanic serum will save animals in which tetanus has already developed. Clinical observations and carefully compiled statistics of tetanus in man indicate that the course of tetanus can be modified, and in many instances life saved, by proper use of antitetanic serum.

The frequent delay in giving antitoxin, after symptoms of tetanus have appeared, the complications of sepsis in lacerated wounds, the occurrence of late death from indirect complications, and the totally inadequate methods of use of serum, have

served to cast doubt hitherto on the curative value of antitetanic serum.

The frequently employed method of giving small doses subcutaneously every few hours, and gradually increasing the dose as the symptoms advance, disregards entirely the pathogenesis of the disease, is wasteful of an expensive remedy, and is usually without therapeutic result.

If the patient is seen early, before fatal intoxication of the central nervous system has already occurred, prompt neutralization of all free toxin in the circulating blood by large intravenous injection, and the neutralization of a part of the toxin already in the central nervous system by intraspinal injection, combined with the judicious use of sedatives and other indicated medical and surgical measures, will save a considerable number of patients who would otherwise die.

PATHOGENESIS OF UMBILICAL HERNIA.

Moschcowitz (*Annals of Surgery*, May, 1915) holds that an umbilical hernia in an adult probably had its origin in early infancy. He calls attention to certain fundamental facts—*i.e.*, the circumstance that with certain exceptions, namely, where the viscera or their mesenteries find their attachment, the abdominal parietes are lined throughout by peritoneum.

External to the peritoneum, and separated from it merely by the more or less developed properitoneal fat, there is everywhere a continuous layer of a strong fascia. This fascia has received different names in different parts of the abdomen, depending upon the particular anatomical location; but in this connection the only particular point to remember is, that it is only one, and a continuous layer. This continuous layer for the sake of simplicity may be called the transversalis fascia, though it receives different names in different localities. Hence before a vessel can escape from or enter the abdomen, there must be an opening in the transversalis fascia—*e.g.*, the internal inguinal ring, or internal femoral ring.

These openings are not bounded by an abruptly terminating sharp edge. At the point of exit of the vessel the transversalis fascia becomes everted, and is prolonged on to the vessel in the form of an adventitious covering, finally blending with the wall of the vessel itself. These openings of the transversalis fascia are bases of lesser resistance and are the only locations in which hernial protrusions occur. It is obvious that the above mentioned prolongations of the transversalis fascia form one of the coverings of the hernia. The urachus passes from the inferior margin of the umbilical ring perpendicularly downward to the vertex of the bladder. The two umbilical arteries also pass downward, but slightly diverging from each other, to the lateral aspects of the bladder. A single umbilical vein passes from the upper part of the umbilical ring backward and upward and slightly also to the right, into the round ligament of the liver.

Coincident with the healing of the umbilical ulcer, incident to severing the cord, which healing results in slightly depressed cicatrix, the three vessels which enter into the formation of the umbilical cord become thrombosed, this thrombosis extending up to the first collateral branch. Two umbilical arteries thus become converted into the two obliterated hypogastric arteries, and finally form the two lateral superior ligaments of the bladder; while the umbilical vein enters into the formation of the round ligament of the liver. During fetal life the adventitia of the umbilical arteries is particularly strongly developed, and on the cessation of circulation within the lumen, this coat contracts and retracts, thereby fastening these vessels firmly to the inferior margin of the umbilical ring and against the anterior abdominal wall, filling the lower portion of the umbilicus with a firm layer of tissue which acts as a barrier against the development of hernia at this point. These changes do not take place to such a marked degree in the umbilical vein, and there remains constantly a more or less developed hiatus between the obliterated vein and the upper margin of the umbilical ring. Neither the superficial fascia nor the transversalis fascia, nor the peritoneum,

enter into the formation of the linea alba, all these structures passing freely from one side of the abdomen to the other. The umbilicus may be regarded as a hiatus or defect in the linea alba. The subcutaneous fat ceases at the margin of the umbilical ring; so that the cutaneous cicatrix becomes adherent directly to the underlying superficial fascia. The apparent depression is due merely to absence of subcutaneous fat in the umbilicus. At the location of the umbilicus the transversalis fascia is especially strong. Practically the most frequent variety of umbilical hernia is that which utilizes the opening for the umbilical vein for its exit. The coverings of such an umbilical hernia therefore are: (1) Skin; (2) subcutaneous fat only in the upper part, none in immediate relationship with the hernia; (3) greatly attenuated superficial fascia; (4) greatly attenuated transversalis (Richet's) fascia; (5) peritoneum. Owing to the great thinness of these structures, practically all these layers are fused together.

In the operation for cure by overlapping from above downward there should be no effort made to dissect the peritoneum loose from the transversalis fascia and close it by separate suture.

INJURIES TO THE NERVOUS SYSTEM IN WAR.

LEWANDOWSKY (*Berliner klinische Wochenschrift,* Jahr. 51, Nr. 51) says that the number of injuries to the nervous system in the European war is very great. In one group of seriously wounded numbering 120 there were 20 cases of injury to the nervous system. This was true in face of the fact that many of the fatalities on the field of battle are due to wounds of the nervous system, and further that many of those with grave wounds of the nervous system cannot be removed beyond the field hospitals. For the same reasons most of the wounds seen at the base hospitals are of the peripheral nerves. As regards brain injuries as seen at the base hospitals, they do not differ in any important way from those seen in times of peace. The injuries due to shots with rifles at close range and artillery are such as to be either immediately fatal or not to permit of transportation. Most of the brain rifle shots dealt with at home hospitals are those of the convexity with openings of entrance and exit or are tangential shots without injury to the dura.

The wounds of the base, of which a few were observed, differ from those in times of peace chiefly by reason of the fact that on account of the great penetrating power of the bullet it is not retained. In case of wounds by fragments of grenades and shrapnel, these fragments were usually retained. In many cases small fragments embedded in the brain are not discovered until an *x*-ray picture is made. In one case of injury to the extremities there was also a shrapnel ball embedded in the brain, yet the victim was aware only of the former injury. At times in an artillery shot which grazes the head fragments will embed themselves in the brain. In all cases in which the missile is retained the question of its removal arises. The author's opinion is that the mere presence of an aseptic object in the brain does not of itself constitute a reason for its removal. Also often there are so many fragments in the brain as to render their removal impossible. If the object is easily reached one would in most cases do well to remove it, but when deep seated its removal should be undertaken only under the most pressing indications, as, for instance, the suspicion of an abscess. The symptoms of brain injury are chiefly those dependent on wounds of the cortex, such as various monoplegias and localized disturbances of sensibility. In cases in which there is no penetration of the skull, as in grazing shots, the indication for operation consists in evidence of meningeal hemorrhage.

Contrary to the experience in brain injuries—and the skull seems to be the only region of the body which can be operated upon with impunity under battle conditions, some surgeons reporting that they have spent whole days in such operating with good results—the spinal cord injuries offer but little opportunity for operative work.

The young surgeon is apt to conceive the idea that spinal injuries offer a good field for operation, but he will find out on acquiring more experience that his belief is not justified by the results. The most important things in the treatment of spinal cord wounds are the prevention of infection of the bladder and bed-sores. Injuries to the cauda equina are more closely related to peripheral nerve injuries. The immediate danger to life is not so great as when the cord is involved, especially if the bladder in a measure retains its function. But wide-spread bilateral paralysis together with disturbances of sensation constitute a sad picture. The operative results are not good.

Wounds of the large peripheral nerves are very common. Out of a half-million wounded which were treated in Germany there were between 7000 and 8000 in which the peripheral nerves were involved. Injuries to all the different nerves have been observed, but chiefly of the upper extremities and the brachial plexus in the groove above or below the collar-bone. Not infrequently the cranial nerves, especially the facial nerve, are injured. Injury to the nerve roots is very rare. The symptomatology offers a good deal that is new, chiefly on account of the incredible combinations of injuries. Not seldom the pain is very severe. Especially the pain on any movement which stretches the nerve is apt to be very severe and of long duration.

Differentiation has to be made between nerve injuries and injuries to muscles which produce contractures and injuries to joints which result in atrophy. Nerve injuries are due almost entirely to infantry missiles. It is not often that the missile lodges in or near the nerve. As in case of the brain the shots which graze are very deceptive, as they frequently result in deposit of particles in the nerves. When a foreign body is lodged in or near a nerve the indication, of course, is to remove it. As to the operative indications in the remaining case it must be kept in mind that it is rare to have a nerve severed; also that a shot penetrating near a nerve may cause paralysis without direct injury to the nerve, which is embedded in a bloody gelatinous exudate which also infiltrates it. The principal indication for operation lies in the necessity for freeing the nerve from a scar. The indication for operation upon a nerve because of pain is not clear and decision is difficult. One should operate in such cases only when other means of treatment fail. Unfortunately in war one sees at times ischemic paralysis of the nerves due to the use of the Esmarch bandage which may be left on from ten hours to three days. The prognosis in these cases is absolutely hopeless.

THE OPERATIVE TECHNIQUE OF ILEOCOLOSTOMY AND OF COLECTOMY.

Arbuthnot Lane (*British Journal of Surgery*, No. 8, April, 1915) performs colectomy in preference to colostomy when the condition of the patient and the comparative ease of the performance justify the major operation. The immediate risks of ileocolostomy are greater than those of colectomy. Convalescence after colectomy is much less serious and anxious than in the case of ileocolostomy. This because the intra-abdominal tension is much reduced by the removal of the large intestine. Excision of the large bowel removes all the material accumulated in the large intestine, while it enables the growth and any infected lymphatic glands to be removed more effectually than they can be by any other operative procedure. It leaves a loose abdomen, with perfect drainage through the ileocolic junction. Also, it affords the patient the great advantages which accrue from a colectomy; it presents enormous advantages over partial resection of the bowel for cancer. The formation of adhesions between intestine and the abdominal wall is the one great risk of both operations. If such adhesions could be avoided we would be able to make colectomy one of the simplest, and at the same time most efficient, operations in surgery.

Cases of stasis are classified by taking two extremes. There are some in which the cecum is loose, enormously dilated, and occupying the whole possible space in the

true pelvis; in which the large bowel is loose, and there is no attempt on the part of nature to form evolutionary adhesions; and in which the pelvic colon is enormously elongated and its mesentery very long. In these circumstances the intestine is almost asking the surgeon to take it out, and its removal is effected with the greatest ease and rapidity. On the other hand, in the case of the man with a good deal of fat distributed through the abdominal wall, mesentery, and intestines, with the large intestine fixed at every possible point by means of abundant evolutionary bands and adhesions, and with very short mesenteries, the difficulties experienced in removing the bowel and in effecting a perfectly safe junction between the ileum and pelvic colon are quite considerable. It is in this class of patients that the surgeon is tempted to confine himself to the performance of ileocolostomy rather than take the risk of removing the large bowel. There is one great comfort about this type of patient: they are much less liable to develop inflammatory adhesions between the small intestine and abdominal wall.

As for ileocolostomy, the abdomen is opened by a vertical incision to the left of the middle line in order to avoid the rectus muscle and so to obtain a more secure abdominal scar. When the patient is being put under the anesthetic, saline solution is introduced by continuous method into both axillæ, and about six or more pints are injected in this way during the course of the operation. The ileum is grasped by two pairs of forceps, whose blades are placed in immediate contiguity. Unless there is any contraindication, such as tuberculous ulceration of the intestine, the ileum is conveniently divided within five or six inches of its termination. This can be done best by means of a cautery between the blades of the two pairs of forceps. The distal aperture is closed by a running suture, and this is buried by means of an encircling thread perforating the peritoneal and muscular coats only. The proximal end of the bowel is then inserted into the pelvic colon at its upper part, the mucous and other coats being sewn together by a close buttonhole suture. Around this another row of sutures perforating the peritoneal and muscular coats is employed. Should the juncture appear insecure at any point, either owing to tenuity of the wall of the ileum, to inflammatory changes in the coats of the pelvic colon, or to the abundant deposit of fat in its peritoneal coat, another row of sutures may be employed with advantage.

The intestines are drawn up out of the pelvis, and the adjacent surface of the pelvic colon is sewn carefully to the divided margin of the mesentery of the ileum. It is of the greatest importance that this junction should be made secure, and in order to effect this purpose it is well to introduce a line of sutures in the lower as well as in the upper aspect of the junction. If these mesenteries are not secured the operation is very likely to fail, since the small intestines drop through the interval, till finally the ideal effluent is controlled by the torsion on its long axis of the end of the ileum. The failure to effect this closure has brought the operation into a certain amount of disrepute, and has involved much avoidable misery and disappointment to the patient. The junction must be effected most carefully and securely, since in ileocolostomy the constant pressure exerted on it by the small intestine tends to separate the mesenteries from one another and to bring trouble or disaster on the patient.

Cases operated on without closure of the interval between the mesenteries have come into Lane's hands as acute obstructions, or complaining bitterly of pain, distention, and diarrhea. If the last kink is very marked and the colon is tightly fixed at the brim of the pelvis, nothing need be done to it; but if it is not so fixed the bowel and mesentery should be sewn tightly down to the brim, so as to reduce the tendency to the regurgitation of feces up into the iliac colon. This should be done very thoroughly, as time tends to lessen this connection.

An esophageal tube is now introduced through the anus into the pelvic colon, and is guided by the fingers through the ileocolic junction into the ileum for a distance of about eight inches. It is secured by means

of a suture to the margin of the anus in the male, or to the back of the labium in the female. If any difficulty is experienced in passing the tube, a quantity of paraffin is injected through it which very materially facilitates its introduction. This tube prevents the accumulation of gas in the small intestine, and permits of the free passage of the fluid contents through the junction, and their collection in a vessel beneath the bed.

In this way the patient can be fed almost at once after the operation. Before the incision is closed completely, a rubber tube is introduced into the peritoneal cavity and about two or more pints of warm saline solution are introduced. This is done in order to diminish as much as possible the tendency to the formation of adhesions. In order to reduce this risk still further, the patient is moved about from side to side at frequent intervals. (This is more important in the case of colectomy than in that of ileocolostomy, because of the number of ligatured points in the former.)

In colectomy the surgeon's chief object is to separate the evolutionary adhesions from the mesentery in the first instance. If this is done carefully, the outer peritoneal aspects of the mesenteries are left smooth and intact. By doing this, not only is the removal of the bowel greatly facilitated, but little or none of the mesentery is denuded of its peritoneal covering, so that the risk of adhesion to loops of the small intestine is reduced in a manner corresponding to the care that is taken.

In ligaturing the vessels, the inclusion of large masses of mesentery should be avoided, and subsequently all ligatured points should be rendered as inconspicuous as possible. It is well to remember that one of the chief immediate risks of the operation is hemorrhage, which may result either from the escape of a vessel from the ligature in a fat subject, or from the friability of the ligatured vessels in a thin, toxic one.

If the surgeon is unfamiliar with the mode of development and attachments of the evolutionary bands, much difficulty may occasionally be experienced in the removal of the splenic flexure, where these bands are highly developed. This difficulty is probably responsible for the partial resections which are performed by some surgeons, who are satisfied to remove the bowel up to the middle of the transverse colon. Lane experienced the same difficulty many years ago, and very soon found the futility of this method, since the obstruction afforded by the splenic flexure and last kink militated greatly against the success of the operation. By separating the acquired from the normal mesenteries, the splenic flexure can be dealt with with great ease and at no risk.

In colectomy the ileum is divided as in ileocolostomy, usually within a few inches of its termination; but should there be much tuberculous ulceration of the ileum, or adhesion binding it down and obstructing it, more or less of the length of this bowel can be removed with safety. The surgeon should remember that while only a small proportion of the length of the small intestine is required for health, the longer the small bowel the greater is the increase in weight of the patient which results from the operation of colectomy. When the patient is stout, the reduction in bulk and the increase in activity which result from a shortening of the small intestine are a material advantage to the patient.

The pelvic colon is drawn up out of the pelvis, and grasped with two pairs of forceps about an inch and a half to two inches above the level of the pelvic brim, so affording a sufficient length of pelvic colon to which the end of the ileum can be securely attached.

The end of the ileum is attached directly to the cut end of the pelvic colon. The innermost row of sutures perforates all the coats of the bowel, and is of the buttonhole type, while the outer rows secure the peritoneal and muscular coats in their grip and do not perforate the lumen of the bowel. Some difficulty may occasionally be met in effecting the junction because of the difference in caliber of the two portions of bowel; but this can be readily met by arranging the sutures so that each picks up a correspondingly greater portion of the

circumference of the pelvic colon than of the ileum. Much fat in the peritoneal coat is another obstacle to the formation of a perfectly secure junction, but most of this can be removed before the anastomosis is attempted. Again, a thickening of the walls of the colon, and a reduction of its lumen by inflammatory changes which commence in the mucous membrane, may render this operation difficult. None of these obstacles are insuperable, and by the exercise of a reasonable amount of skill and patience a perfectly safe junction can invariably be effected.

After this anastomosis has been rendered complete, the cut edges of the mesentery of the ileum and of the pelvic colon are sutured together, care being taken to leave no raw surface either on the upper or lower aspect of the junction. An esophageal tube is introduced through the rectum and ileocolic junction, as described in the operation of ileocolostomy without resection of the large intestine.

CEREBROSPINAL FEVER: DIAGNOSIS AND TREATMENT.

FOSTER (*British Medical Journal,* March 27, 1915) basing his work on his experience at the first Eastern Hospital at Cambridge, covering 25 cases drawn from a very wide area, observes in several of the cases the cerebrospinal fluid was sterile at the first puncture. The organism of Gram is rarely found in smears taken direct from the cerebrospinal fluid, but has to be cultivated. When the organism with its characteristic intracellular growth is easily found in smears in the cerebrospinal fluid, either in the first instance or at the second or third attempt, its presence is of grave prognostic import. A further point is the presence or absence of sugar in the cerebrospinal fluid; this, which is generally absent in the first instance, may reappear as the case improves, and again disappear in a relapse. Retraction of the head was present in every case but one, in whom there was no rigidity at any time though he was suffering from purulent meningitis. In four of the cases definite rash appeared, consisting of discrete papules varying in color from scarlet to mulberry. The type of rash consisted in large purpuric spots. The majority presented no specific rash, hence the absence of rash is of no diagnostic value. Herpes appeared in only eight cases.

As to the involvement of the cranial nerves: strabismus in one case, diplopia in another, slight nystagmoid movements in a third, and slight ptosis in a fourth. The comparative rarity of such symptoms presents a striking contrast to their frequency in tuberculous meningitis, and should prove of value in diagnosis. Excluding fatal cases which have never recovered consciousness, deafness has only occurred twice. Vomiting has always been present, excepting in fulminating cases. In no case was the knee-jerk exaggerated. The plantar reflex has always been flexor, and Kernig's sign has always been present, as was the tache cerebrale. The sphincters were affected in a considerable proportion of cases. In some instances in which the cerebral symptoms were comparatively slight and there was certainly no mental dulness, retention of urine for two or three days was observed. This coupled with mild cerebral symptoms may reasonably give rise to a distinct suspicion of cerebrospinal meningitis.

In 14 cases there was a distinct history of an initial rigor. Several of the more severe showed only a small range of temperature. In four confirmed cases in which the cerebral symptoms were slight the pyrexia continued from two to three weeks, and in two instances assumed a curious resemblance to that of a tertian fever.

The author states that the occurrence of headache and vomiting, coupled with retraction of the head and retention of the urine, comprises a group of symptoms which should indicate the probable nature of the disease. Kernig's sign is of value in mild suspected cases. The presence of a rash may be confirmatory, but in forming a diagnosis no weight should be attached to its absence.

Excellent results have been obtained even

in severe cases by repeated lumbar puncture with the removal of half an ounce to an ounce of cerebrospinal fluid. Antimeningococcic serum has been introduced into the theca, but in so far as a conclusion is warranted from so small a number of cases, this method does not give better results than lumbar puncture alone.

NOVOCAINE ANESTHESIA IN NORMAL CHILDBIRTH.

BOLLAG (*Münchener medizinische Wochenschrift,* Jahr. 62, Nr. 8) says that a requisite for a method of controlling the pain of childbirth is absolute harmlessness. So far as the actual labor pains themselves are concerned no such method is up to the present time available; but a method is available for relief of such pains as arise through the medium of the pudic nerve. This method has been tested by the author in 225 cases in the clinic of von Herff. It is recalled that the pudic nerve has three important branches which supply the anus, the muscles and skin of the perineum and the labia, and the region of the clitoris. Fortunately for purposes of anesthesia these branches pass close together at a point which is easily reached. The anesthetic substance used is novocaine and suprarenin in 2-per-cent solution, of which 5 Cc. usually suffices, though at times twice this quantity may be needed. The technique is not difficult but requires some practice. Certain failures in the hands of the author and his colleagues were doubtless due to improper carrying out of the injection. A 5-Cc. Record syringe with a needle at least 6 cm. long is used. The patient lies upon her back with the hips flexed. After the tuber ischii is located with the finger the needle is thrust deeply just posterior to the tuber ischii, between it and the middle of the perineum, in the direction of the lesser ischiatic foramen. About 2 Cc. of the solution is injected while slightly withdrawing the needle; then the needle is withdrawn till the point is just under the skin and ½ Cc. injected subcutaneously into the perineum. This procedure is repeated on the other side. In very fat persons in whom localization cannot be well carried out, double the quantity should be used. The best time to make the injection is when the head is well down toward the perineum. There is difficulty about properly timing the injection, for in delayed cases it is apt to be made too soon, while in rapidly progressing cases it may not be made soon enough. Anesthesia is complete in five minutes or at most ten minutes, and has lasted as long as three hours.

This form of anesthesia is most valuable in primipara. By this means the stretching and even tearing of the perineum which occurs at times in spite of all efforts at prevention is entirely painless. If episiotomy is found advisable or if immediate repair of the perineum is needed, these procedures are painless. Patients otherwise very restless and hard to control during the latter part of the second stage of labor are under this influence quiet and restful. Patients are uniformly grateful for this form of anesthesia. Not the slightest bad influence or effect has been observed. On account of its simplicity the method is adapted to general use in domestic practice.

ARTERIOVENOUS ANASTOMOSIS IN IMPENDING GANGRENE.

STETTEN (*Surgery, Gynecology and Obstetrics,* April, 1915) concludes an excellent paper on this subject as follows:

It must be conceded that the utility of arteriovenous anastomosis as a therapeutic measure is open to grave question. It effectually has been shown:

That the arterial circulation to the periphery, even in very advanced arterial disease, is in every respect better and easier than the retrograde venous circulation, mainly because of the obstruction offered by the valves and the short-circuiting of the blood through anastomoses of neighboring venous collaterals.

That the operation is dangerous, and the results have been most unsatisfactory except in a very small percentage of cases.

That the few so-called successful results have probably been obtained more in spite of than because of the operation, inasmuch as various factors play a rôle in the improvement of these cases, as improvement has been recorded after definite closure of the anastomosis, and as failure has occurred with perfect patency of the arteriovenous fistula.

That even if the anastomosis functionates, which it rarely does, there is no possibility of circulatory improvement, but rather quite the reverse.

That the term "reversal of the circulation," at least as far as clinical cases are concerned, is absurd.

That even if the usefulness of the operation were proved beyond question, the possible indications would be restricted to an unappreciable minimum.

He therefore feels that the skepticism of Lejars, Lenormant, and Wettstein is a trifle too mild. Even Coenin is not quite emphatic enough. He rather agrees with Guthrie, who, although having once claimed to have shown with Carrell the possibility of reversal of the circulation in the limb of a dog, deplores the fact that arteriovenous anastomosis should have been applied to the human being for circulatory disturbances of the lower extremity and prophesies its failure; for he believes that it is very questionable if the operation is ever justified. He does not think that he is going too far in advising that this procedure be entirely eliminated from the surgical repertoire.

CONTROL OF HEMORRHAGE.

Ohkochi (*Beitrage z. klin. Chir.*, 1914, xciv, 620) states that the methods of controlling hemorrhage may be classified as physical, chemical, and biochemical. The ideal method, ligature, is not applicable to parenchymatous bleeding. Tamponade necessitates leaving the wound open with danger of infection and secondary hemorrhage. The biochemical method is the transplantation of living material to the bleeding spot. Muscle, fat, fascia, omentum, etc., are used. Recently Kocher and Fonio have reported on a new substance, coagulen, found in normal blood-platelets and said to hasten the formation of thrombokinase.

Ohkochi has experimented with rabbits as to the effect of transplanting living tissues, such as muscle, fat, fascia, and omentum, in stopping hemorrhage from parenchymatous organs, especially the liver, spleen, and kidney. In general he found that the hemostatic effect of living tissues is largely a mechanical one and that the thrombokinase has a minor effect. In order to stop hemorrhage the tissues must have a certain size and thickness, the wound must be carefully cleaned, and the flap pressed against the wound for several minutes. The ability of the tissue to adhere to the wound surface plays an important rôle and is most marked in muscle tissue.

Muscle tissue is the most useful material because it adheres promptly, while fat is friable, and fascia easily rolls itself up. In operations on the liver a flap of omentum is most useful. In kidney operations perirenal fat is conveniently used.

In reference to the hemostatic effect, muscle tissue stands first, fascia last. Healing is delayed if the transplanted tissue undergoes necrosis. In wounds of the liver a large percentage of the muscle flaps became necrosed. In kidney wounds muscle usually healed in without necrosis. Omental flaps rarely become necrotic. Adhesions to neighboring organs are more frequent in muscle transplantation. Secondary hemorrhages cannot be prevented absolutely in every case. After healing one finds connective tissue proliferation in the adjacent parenchyma with injury to the epithelial cells.

Ohkochi also experimented with foreign bodies to stop hemorrhage. Pieces of intestine and bladder disinfected with iodine—potassium iodide solution—were used successfully. Finally pieces of sponge sterilized by boiling were found to have a prompt hemostatic effect on parenchymatous wounds.—*International Abstract of Surgery*, April, 1915.

REVIEWS.

MODERN MEDICINE: Its Theory and Practice. In Original Contributions. By American and Foreign Authors. Edited by William Osler, Bart., M.D., F.R.S., and Thomas McCrae, M.D. Volume V: Diseases of the Nervous System—Diseases of the Locomotor System. Second Edition, Thoroughly Revised. Illustrated. Lea & Febiger, Philadelphia and New York, 1915.

The present book represents the fifth and final volume of the second edition of "Modern Medicine," edited by Osler and McCrae. This system, in its original form, comprised seven volumes, but by a general condensation, increase of size of page, and augmentation of the number of pages per volume, it has been possible to reduce the number of volumes to five without impairing the practical character of the work. In fact it will be found that its practical worth has been increased by the added stress laid upon diagnosis and treatment. Because of the fact that the success of the first edition has borne certain initial expenses, it has been possible to offer the present edition at a price which makes it available to all.

The fifth volume includes Diseases of the Nervous System, contained in Part I, and Diseases of the Locomotor System, contained in Part II. The former includes an excellent introductory chapter by L. F. Barker, in which are discussed in a general way the senses and their symptomatology, disturbances of sensation and of motility, anomalies of the reflexes, disturbances of complex psychical processes, etc., etc. The careful reading of this chapter elucidates many of the problems discussed in succeeding chapters. The twenty-two chapters which follow are from the pens of distinguished neurologists, who in most instances are eminently fitted to the task by reason of special experience in a given phase of neurological work. Thus Diseases of the Motor Tracts, by W. G. Spiller; The Combined System Diseases of the Spinal Cord, by C. K. Russell; Sclerosis of the Brain, by E. Bramwell; The Diseases of the Meninges, by E. Bramwell; Diffuse and Focal Diseases of the Spinal Cord, by E. F. Buzzard; Topical Diagnosis of Disease of the Brain, by J. Collins; Aphasia, by J. Collins; Tumors of the Brain and Meninges, by H. Cushing; Hydrocephalus, by H. Cushing; Acute Encephalitis and Brain Abscess, by E. E. Southard; Diseases of the Cerebral Blood-vessels, by H. M. Thomas; Diseases of the Cerebral Nerves, by E. W. Taylor; Diseases of the Peripheral Nerves, by G. M. Holmes; Epilepsy, by L. P. Clark; Neurasthenia—The Traumatic Neuroses and Psychoses, by C. W. Burr; Hysteria, by S. E. Jelliffe; Migraines—Neuralgia—Professional Spasms—Occupation Neuroses—Tetany, by S. E. Jelliffe; Paralysis Agitans — Chorea — Choreiform Affections, etc., by D. J. McCarthy; Syphilitic Diseases of the Central Nervous System and Amaurotic Family Idiocy (Tay-Sachs Diseases), by B. Sachs.

Part II includes Diseases of the Locomotor System. The initial chapter deals with Myositis, Myotonia and Amyotonia Congenita, by W. R. Steiner. Probably the most important chapter in the book is the one on Arthritis Deformans, covering fifty-two pages, by T. McCrae. No one is more eminently fitted to write authoritatively on this subject than Dr. McCrae, who has spent so much time in the study of joint affections. To the general practitioner few more difficult problems are presented than those which deal with certain forms of chronic arthritis. The current literature, with its confusing array of terms, has not aided in clarifying our knowledge. In the introductory paragraphs Dr. McCrae states definitely, so far as possible, what conditions are included under various terms, and what is meant by the designations employed. He defines "arthritis deformans to include the group of cases of arthritis which have as prominent features a tendency to chronicity and to more or less permanent change in the joints or structures about the joints, those forms of arthritis with a definite etiology (*e.g.*, gonorrheal arthritis) being excluded." This definition is followed by a very practical classification of arthritis

generally which is of value in separating the various forms of joint affections. It is interesting to note that the writer disagrees with Garrod in the duality of rheumatoid arthritis and osteoarthritis, and rather regards them as forms of the same disease. The nature of the disease, etiology, pathology, symptoms, association with other diseases, diagnosis, prognosis and treatment are discussed in detail. The article is particularly well illustrated.

The final chapters of the book are by G. Dock and C. P. Emerson, and deal with Osteomalacia, Achondroplasia, Hypertrophic Pulmonary Osteoarthropathy, Paget's Disease, etc.

The appearance of the present volume renders available the completed system, which in every respect represents modern opinion rendered by authoritative writers and supervised by distinguished editors. In the success with which this work must meet no little praise is due the publishers for their part in the making of the books. Careful binding, clear print and beautiful illustrations characterize the bookmaker's work. To the general practitioner who wishes to have within reach the master production in medical books of the present time this system comes to a welcome place in the physician's library. E. H. F.

APPLIED IMMUNOLOGY. By B. A. Thomas, A.M., M.D., and R. H. Ivy, M.D., D.D.S. Illustrated. J. B. Lippincott Company, Philadelphia, 1915.

This book, as its title indicates, deals with a subject about which we knew practically nothing two or three decades ago. It is designed to cover the practical application of sera and bacterins when used prophylactically, diagnostically, and therapeutically, and it contains an appendix dealing with the serum treatment of hemorrhage, organotherapy, and chemotherapy. This is the second volume dealing with immunology which has emanated from the Medical Department of the University of Pennsylvania within the last few months, the first and larger one being that written by Dr. Kolmer, a notice of which has already appeared in these pages.

As the authors of this volume have been and are actively engaged in following the various forms of technique which have been developed in this important subject, and as they are familiar with the standard literature dealing with each one, they have been able to present a compact and complete summary of the subject. The use of very large type, widely spaced, causes the volume to be unnecessarily large, but correspondingly easy to read. The text covers a little more than 350 pages.

EXERCISES IN EDUCATION AND MEDICINE. By R. Tait McKenzie, B.A., M.D. Second Edition, Thoroughly Revised. Illustrated. W. B. Saunders Co., Philadelphia, 1915. Price $4.00.

The first edition of this book appeared four years ago, and, as its author has so long been recognized as an authority on the subjects of which it treats, it at once received deserved recognition. We are informed by the publisher that it was promptly reprinted in February, 1912, so that the present second edition, in one sense, may be considered as equivalent to a third.

Dr. McKenzie is not only noted because of his efforts along these lines, but also because, as a skilful sculptor, he is able to depict in clay, and other modeling material, types of physical development and prowess. Indeed, in some directions he is probably better known for his sculpture than for his work in physical culture.

The book contains 33 chapters, the last half of it being devoted to the use of exercises in the treatment of feeble muscles and various states of deformity and disease. The first half describes normal muscles, both voluntary and involuntary, physical education for athletes and in schoolchildren, both boys and girls, and contains an interesting chapter upon physical education of mental and moral defectives. The great advantage of this book is that it is not that of a layman who is enthusiastic in developing the muscles of the body, but of a medical man who thoroughly recognizes that the best athlete is he who has equally balanced, well-developed muscles everywhere.

In addition to a large number of illustrations, practically all of which are original and which serve to clearly illustrate the points which he wishes to emphasize, he has included a number which are typical of

the facial expression of those who are under supreme effort, or who, having been under supreme effort, are in a state of exhaustion. These pictures are indirectly taken from life in that they are reproductions of models of such facial expressions which the sculptor has taken from athletes at various stages of physical effort.

Nobody who is connected with a school of the best modern type and who wishes the pupils under his charge to be thoroughly developed can afford to be without this book, and this may also be said with truth of parents, who by the perusal of its pages will learn much which will be of benefit to them in the training of their children. Doubtless many persons will, after reading it, recognize minor deformities and defects in muscular development which can be speedily corrected by proper exercises before they are so severe as to need very radical measures, and as a physician is very apt to be consulted in regard to such matters by the laity who are largely interested in such subjects, it behooves him to make himself familiar with its contents in order that, by combining his medical information with the special facts here presented, he will be qualified to express an opinion which they will regard as of value. The book is one which we intend to carefully peruse, not only for the purpose of gaining information, but because of the interesting way in which its facts are stated.

MODERN ASPECTS OF THE CIRCULATION IN HEALTH AND IN DISEASE. By Charles J. Wiggers, M.D. Copiously Illustrated. Lea & Febiger, Philadelphia, 1915. Price $3.75.

We have looked forward to the appearance of this book with a great deal of interest, for Dr. Wiggers has already made his mark in pharmacological investigation, particularly in reference to the influence of various drugs and animal extracts upon the circulatory system, especially in the lungs. The first section of the book describes how the circulation is maintained in health according to our modern conceptions of this subject, and it will be recalled that our modern conceptions are very different from those which were maintained when many of our readers finished their lectures upon physiology. For this reason many novel facts will be found by those who have not kept abreast of the recent work concerning the physiology of the circulatory apparatus. The second section deals with the various instruments of precision which are available for studying the circulation of man, and is not a mere catalogue of apparatus, but endeavors to place a correct valuation upon different forms of apparatus and to point out their limitations and errors. This is a most important quality, since all too frequently authors describe apparatus without definite statements as to which is the best for the general practitioner, or the special investigator. In the third part of the volume an effort has been made to correlate the data obtained by experimental investigation of abnormal conditions in the laboratory with the results achieved by the use of instruments of precision at the bedside. The author recognizes that there is a very great difference between the results obtained under these conditions, which again is important, from the standpoint of both the investigator and the clinician. The fact that Dr. Wiggers has been an active worker along the lines which he covers in his volume enables him to present his views clearly, and to wisely include certain conclusions of others. A fairly copious bibliography is appended to many of the chapters.

A MANUAL OF THE PRACTICE OF MEDICINE. Tenth Edition, Revised. By A. A. Stevens, A.M., M.D. W. B. Saunders Company, Philadelphia, 1915. Flexible leather. Price $2.50.

By using thin paper, which is, nevertheless, thick enough to prevent the type of the opposite side of the page from interfering with that which the reader is using, the publisher has managed to bring out a volume of 629 pages in very small bulk. The book does not give a thorough and complete consideration of disease, such as is attempted by larger and standard works upon the Practice of Medicine. It lies between the so-called quiz-book and the standard text-book. Many of the articles have been completely revised and a considerable number of new articles have been added. While most of these do not deal with conditions which are commonly met

with, they are, nevertheless, essential in order that the purchaser of the volume may find in its pages not only a description of the common diseases met with in human beings, but the unusual ones as well. The fact that the book has been reprinted a number of times and has reached its tenth edition in 23 years is sufficient indorsement of its quality.

X-RAYS, HOW TO PRODUCE AND INTERPRET THEM. By Harold Mowat, M.D. (Edin.). Oxford University Press, New York and London, 1915. Price $3.00.

The author tells us that he has prepared the text of this book for those who have little or no knowledge of the subject of *x*-rays. For this reason he has stated elementary facts in such a way that the student or practitioner who reads the volume may be able when he has finished to feel that he has at least a good general idea of this branch of medical investigation. Dr. Mowat has placed the chapter on *x*-ray examination of the thorax and digestive tract before those on bones and joints, because, as he well says, these parts of the body have been so largely studied within recent years with such excellent results. He has not attempted to take up the therapeutic application of *x*-rays, because this is so large and important a branch of radiology that it merits a complete volume for itself. As the author is Radiographer to the Metropolitan Hospital and the Royal Chest Hospital of Edinburgh, he has had ample opportunity to become fully acquainted with the subject of which he writes.

THE MEDICAL CLINICS OF CHICAGO. July, 1915. Volumee I, Number 1. W. B. Saunders Company, Philadelphia, 1915.

It is the intention of the publishers to publish bimonthly a report of medical clinics in Chicago, forming thereby a companion volume to the Surgical Clinics published by the same concern. There are eight contributors to this opening volume who are clinicians actively engaged in hospital work in Chicago. In these clinics many of the problems commonly met with by the internist are discussed, such as nephritis, gout, infantile tuberculosis, lymphatic leukemia, pneumonia, tabes, hour-glass stomach, etc. The volume consists of a little over 200 pages. It is not indexed, other than the table of contents on the inside of the first page of the cover. The print is large and easily read, and in some instances the cases are developed by means of the question and answer method. The volume is also illustrated in colors and in black and white.

SIMPLIFIED INFANT FEEDING. With Seventy-five Illustrative Cases. By Roger H. Dennett, B.S., M.D. Illustrated. J. B. Lippincott Company, Philadelphia, 1915.

We feel that many practitioners will welcome the appearance of a book bearing this title, for most of them have heretofore been somewhat appalled at the complicated formulæ and even mathematical problems which have been used by certain specialists in dealing with this important subject.

The book consists of 28 chapters, and is distinctly therapeutic from the standpoint of dietetics, dealing not only with the feeding of infants in health, but with the use of diet in the treatment of various functional and organic conditions.

The type is large and easily read, and, because of the quality of the text, the volume is one which can be highly recommended to the general practitioner who has under his care infants both well and ill.

THE PRACTICAL MEDICINE SERIES. Volume II: General Surgery. Edited by John B. Murphy, A.M., LL.D., F.R.C.S. England (Hon.), F.A.C.S. Series 1915. The Year Book Publishers, Chicago.

This review of the year's literature evidences a more uniform method of giving anesthetics and analgesics. It is noted that the two newer methods that are being advocated by their introducers and are withstanding the test are of clinical trend—the intravenous ether and saline of Kümmel and the intratracheal insufflation of Meltzer. Seven hundred deaths from anesthetics have been reported in the public press of Great Britain, from 1910 to 1913.

There is a recession in the concept as to the value of arsenical preparations. The reliability of the Abderhalden reaction has not been universally accepted. The mortality of appendicitis and that of peritonitis is

still too great. The average mortality in appendicitis in the hands of many operators and in all stages of the disease is about 10 per cent. Murphy has thrown his customary vividness into the subject-matter and exercised his discriminating judgment in picking what is likely to be most serviceable and permanent from the enormous mass of material presented to the profession during the year.

COLLECTED PAPERS OF THE MAYO CLINIC, ROCHESTER, MINNESOTA. Edited by Mrs. M. H. Mellish. Volume VI, 1914. W. B. Saunders Company, Philadelphia and London, 1915.

This volume belongs to that splendid series which has done so much to standardize clinical surgery. These contributions consist of papers on the Alimentary Canal, Urogenital Organs, Ductless Glands, Head, Trunk and Extremities, and Technique. There are also some general papers, including studies on the etiology of cancer, surgery in relation to life insurance, the story of a short visit to the surgical clinics of Russia, Norway, Finland, Sweden, Denmark, and Belgium; suggestions for medical writers of medical papers; the description of an apparatus to assist in the application of dressings about the hip.

Among the contributors are found William J. and Charles Mayo, Donald Balfour, Emil B. Beckman, William F. Braasch, H. Z. Giffen, W. C. MacCarty, E. S. Judd, Plummer, and others whose names are not quite so widely known, but who under the influence of that wonderful school are producing work fully up to the high standard established and maintained by it.

The book opens with a brief but thoroughly philosophical and comprehensive paper by Charles Mayo on "Mouth Infection as a Source of Systemic Disease." Then follows "Treatment of Chorea" by Archibald. Thereafter "Surgery of the Tonsils" by Matthews and a series of papers upon the "Gastrointestinal Tract from the Therapeutic and Surgical Standpoint."

Throughout the contributions all have their practical bearing on the surgeon's work and embody all that is latest and best in practice.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

During the past four weeks the weather has been remarkably fine—in fact in some parts of the country rain is urgently needed: the continued dry weather is producing a bad effect on some of the industries. Rain is also needed in many of the agricultural districts, and as a result there is likely to be a scarcity of hay and straw. These deficiencies will not, however, be so seriously felt at the present time when horse transport is giving place to the motor car. The lack of rain at this time of the year will also affect the fruit crops, and there will apparently be a poor crop of strawberries this season. The temperature, however, in spite of the lack of rain has not been exceptionally high except for one day early in the month, when it was rather oppressive.

Precautions against air raids—the darkening of the streets and so forth—are still being rigorously maintained. The number of young men about the streets is obviously diminishing, and consequently the number of women has relatively increased. Some of the latter in a mistaken sense of duty render themselves rather unpleasant by accosting men of various ages and asking them why they are not in khaki! This is irrespective of the obvious age of the men thus accosted. Undoubtedly a certain amount of moral persuasion of this character is being employed and frequently has the desired effect. The results are sometimes amusing, as in the following instance:

A most typical case of aortic and mitral regurgitation which attends my out-patient service is a man who originally earned his

living by going round the country teaching ju-jutsu. He used, before his illness, to give demonstrations at various schools, the universities, and also to the police. When he developed his heart lesion he obviously had to give this up, but after a prolonged rest in hospital he was able to get about and had to seek fresh employment. He chose that of photography, and for some time earned a respectable living taking cheap photographs. Latterly, however, on two occasions his apparatus has been smashed up, and he is constantly being jeered at, so that in self-defence, and being weary of the taunts thrown at him, he went to the recruiting office and offered himself for enlistment, such offer, of course, being quite futile. He has now obtained a form which he can produce to show that he is physically unfit for service. This case is by no means an isolated instance of the amount of moral suasion which is being employed.

The fact that this country has, on several occasions, been attacked by Zeppelins does not seem to have produced any marked effect in the way of terrorization, which we are led to believe is the object of these raids. Very few details are published as to the results of such raids, but on the other hand one meets friends or patients who have been in the vicinity of raided areas. From these we learn that the Zeppelins are objects of interest rather than of terror, that they appear to be at an enormous height, that the men apparently are unable to see objects on the ground, or if they do so, their aim is extremely inaccurate, as the harm done by the bombs dropped is comparatively insignificant. In places where a number of bombs are dropped, some of course must do damage, but it is extraordinary what a large number of them fall in fields and gardens and either do not explode, or if they do, result in very little material damage. Numbers of windows, however, are smashed in these areas. This also happens in the neighborhood of the arsenals where the great guns are being tried, and in the latter case the people are less disturbed by explosions than people of other districts. Following the alleged threat of the German Emperor of a raid on the West End of London, we are anticipating such an event with no great uneasiness. It must obviously be a matter of chance whether the house you are living in is hit or not! I am told that it is a very fine sight to see a Zeppelin high up in the sky at night with the searchlights playing on it. In the autumn it was stated that motor cars with bright headlights were employed to indicate routes, etc., for the Zeppelins, but I am given to understand that at the height at which the Zeppelins have to travel the strongest motor lamp would be quite invisible.

Female labor is now being largely employed. This is most noticeable at the various railway stations, where women are issuing and collecting tickets, especially at the tubes and Metropolitan Railways. They are sometimes surrounded by a crowd of admirers which is apt to cause delay. At a certain station the other night there was a red-haired girl of about fourteen years of age, with two rat-tails down her back, calling out the newspapers in a most approved newsboy fashion and returning chaff as good as she received. She might have been at it for several years, and was quite the equal of any street arab. A certain number of women are also employed on police duties, and others in driving the delivery cars of some of the large shops. The latter have to conform to the efficiency regulations of Scotland Yard before they are allowed to be in charge of a motor van. The tram strike has now ended, and it is noticeable—in the South London area, at all events—that the drivers and conductors are much older men. This is in accordance with the determination of the County Council not to employ any men of military age. At the entrance of the tunnels at either end of the stations on the tube railways, railings are being erected, the object of which is to prevent people getting from the platform into the tunnel, and I am told that they are being constructed in anticipation of a possible rush to the tubes should London be bombarded during the daytime.

The recent report of the Registrar-General on the birth-rate and infant mortality is certainly alarming. It shows a considerable diminution in the birth-rate and also an increase in infantile mortality. The death-rate for children in the metropolitan area since the beginning of March shows an increase of two hundred per week over the corresponding period in the preceding year. This year there has been a severe epidemic of measles, which always takes its toll of the young. The type of epidemic was rendered more severe by the aggregation of men in camps, and was disseminated by those returning home for week-end leave. It is probable also that the increased employment of married women, owing to the lack of male employees, has had a deleterious effect on child life. Such day nurseries as have been established in London have been very largely closed down owing to the fact that it is impossible to get money for any charitable object unconnected with the war. The children who might have been looked after in such day nurseries have been confided to the tender mercies of a neighbor or a professional child minder, to whom threepence or fourpence a day is paid. These "minders" cannot and do not give the children the attention they require or the proper quality of food for their respective ages. From the statistics collected it is satisfactory to be able to report that the recent alarming statement as regards war babies has been very much exaggerated, and that in all probability the illegitimate birth-rate will hardly rise at all during the present year.

It is satisfactory to be able to note that public health projects have not been allowed to lapse during the current year. In London, the County Council, backed by the Local Government Board, is pushing forward its scheme for the treatment of tuberculosis. The Council is obtaining and paying for beds in public hospitals: First, for such acute conditions as hemoptysis and pleurisy, for cases of doubtful diagnosis, and for those in whom, owing to the presence of an acute exacerbation, a suitable line of treatment cannot immediately be determined. Secondly, for cases which are not suitable for sanatorium treatment, but may improve by prolonged rest and treatment in an institution. Thirdly, a Board of Specialists is being appointed to whom doubtful cases may be referred. The Local Government Board is also insisting that all dispensaries shall be linked up in this scheme, and that an agreement shall be made between the dispensary and a hospital in its neighborhood, so that examinations by *x*-ray or in the special departments can be made in doubtful cases. A scheme is also being propagated for an "infants' welfare station" on very similar lines to those established in New York, the objects being to supply clean milk for the children and to educate the mothers in the care of their children. This scheme aims at the reduction of the infantile mortality. Efforts will be made to improve on the conditions of dairy farms and dairy shops and on the precautions taken to insure cleanliness in the transportation and distribution of the milk, and also its after-care in the home. Amongst other members of the Council the name of Sir W. Osler is being included.

Attention has recently been drawn by the Port of London Authority to the fact that the measures recommended in 1913 for the destruction of rats have not been carried out as efficiently as might have been hoped. Since the corporation undertook the extermination of these pests from the docks over 800,000 have been accounted for. During the last twelve months 43,000 were killed, and of these 2000 were examined bacteriologically for evidence of plague, but none gave any signs of the disease, though during the previous five years infected rats had been found on many occasions. It may be remembered that two years ago a few cases of plague were noted near Ipswich, that infected rats and rodents were discovered, and that the cause of the outbreak was attributed to them. Since that time I am not aware that any other cases have been notified or suspected.